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Index to Contents, Page 4 Advertising index, Page 33

Experience

Below is given a list of the gas companies which have built or are building Koppers Coal Gas Plants:

Laclede Gas Light Co.	St. Louis, Mo.
Providence Gas Company	Providence, R. I.
Public Service Gas Co.	Camden, N. J.
Indiana Coke & Gas Co.	Terre Haute, Ind.
Battle Creek Gas Co.	Battle Creek, Mich.*
Consumers Power Co.	Zilwaukee, Mich.*
Winnipeg Gas & Electric Co.	Winnipeg, Canada*
Utica Gas & Electric Co.	Utica, N. Y.*

*Under construction.

To this list should be added the following companies which buy a large percentage of their gas from plants owned and operated by The Koppers Company:

Public Service Gas Co.	Newark, N. J.
St. Paul Gas Company	St. Paul, Minn.
Peoples Gas Light & Coke Co.	Chicago, Ill.

The plants listed above range in capacity from 1,000,000 cu. ft. per day to as high as 30,000,000 cu. ft. per day.

In addition to the list above given, The Koppers Company has built a total of 39 other plants for the production of coke and gas. The knowledge and experience gained in this vast amount of work is at your service. It is embodied in the coal gas plants which we are now building and is a most convincing reason why you should consult us before going ahead with any program for increasing your gas output.

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Pittsburgh **Chicago**

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	Capacity Tons per day
*Dundee, Scotland (2nd Installation)	110
*Brechin, Scotland	21
*Newton-in-Makerfield, England (Extension)	18
*Dunfermline, Scotland	110
*Lochgelly, Scotland	21
*Ripon, England	40
*Walsall, England	100
*Kilsyth, Scotland	24
*Inverness, Scotland	40
*Bergen, Norway (2nd Installation)	57
*Stockport, England	168
*Glasgow, Scotland	1,356
*Adelaide, Australia	80
*Portsea Island, England (2nd Installation)	140
*Carnoustie, Scotland	21
*Wexford, Ireland	18
*London, G. L. & C. Co. (4th Installation)	200
*Neath, Wales Kensal Green	60
*Bolton, England (2nd Installation)	168
*Workington, England (Extension)	23
*Stourbridge, England	80
*Wolverhampton, England	80
*Troon, Scotland	28
*Trondhjem, Norway (2nd Installation)	38
*Warrington, England	112
*Manchester, England	336
Carried Forward	3,452

	Capacity Tons per day
Brought Forward	3,452
*Newton-in-Makerfield, England	21
*Wallasey, England (2nd Installation)	120
*Lanark, Scotland	21
*Gourock, Scotland	28
*Brighton, Australia	60
*Fremantle, Australia	20
*Christchurch, New Zealand	40
*Wanganui, New Zealand (2nd Installation)	40
Perth, Australia	60
*Birmingham (7th Installation) Nechells	840
*Sheffield, England	336
*Dairen, S. Manchuria	100
*Paisley, Scotland	140
Hinckley, England	60
Dresden, Germany (3rd Installation)	180
Cheltenham, England	120
Market Harborough, England	26
Leatherhead, England	40
The Hague, Holland	168
Liverpool, England	100
Paris, France	420
Geelong, Australia	60
Aberdeen, Scotland (2nd Installation)	192
Innerleithen, Scotland	7
Poole, England (4th Installation)	168
Buffalo, N. Y.	280
TOTAL CAPACITY Tons per day	7,166

*In Operation

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NEWARK, NEW JERSEY

Gas Engineers and Builders of Gas Works

American Gas Journal

SIXTY FIFTH YEAR

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Contents of This Issue

Gas the Ultimate Fuel for Industry—By Henry O. Loebell..... 673
Why Coal Takes Fire Spontaneously—By O. P. Hood..... 676
World's Largest Spiral-Guided Gas Holder 678
Activities at the Public Service Co. of Colorado—J. B. Dillon.... 679
Religion and Business—Good Mixers 680
The Therm System of Gas Payment—By F. Johnstone Taylor.. 681
Gas Wrinkles 682
Editorial 683
A Retrospect
Salient Figures of the Manufactured Gas Industry in 1922..... 686
A Set of Safety Rules for By-Product Plants 687
News of the Gas Industry..... 688

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Gas the Ultimate Fuel for Industry*

The development and possibilities of gas in industrial furnaces

Henry O. Loebell

Vice-President and General Manager, Combustion Utilities Corporation

I KNOW of no business activity or industrial institution that has grown so rapidly as the sale of gas for industrial purposes. Although we marvel at the astounding development of the automobile business and the petroleum industry, it is a fact that the growth in the sale of industrial gas has been greater than either of these major activities.

During the past ten years the sale of gas for industrial purposes by the gas companies of the United States has increased more than 1000 per cent. Besides, this tremendous growth has taken place in spite of the fact that, generally speaking, the price of this gas has been between three and five times greater than that of the competitive liquid and solid fuels.

There can be only one explanation for this extraordinary expansion—a more widespread appreciation of gas as the "ideal fuel" and as the "ultimate fuel."

Basic Reasons for Gas as Ultimate Fuel to Be Discussed

Now, if this is the case, if gas is really the fuel which will ultimately take care of all industrial heating operations, there naturally must be some very fundamental and basic reasons why this is so. This evening I should like to talk over this matter with you with the thought of analyzing the basic considerations involved, in order that we may all arrive at some definite conclusions as to what developments we may expect in giving the industrial world a better industrial fuel.

As I see the problem, there are two basic considerations involved—first, the scientific factor which involves the effective utilization of the fuel, and, secondly, the economic factor which involves not only the present cost of the fuel, but also the supply of crude materials available for its manufacture and general trend of its availability at the lowest possible cost to the industrial plant.

"Control" the Important Factor

The outstanding success of the use of central station gas as an industrial fuel has been due to the fact that gas is scientifically correct. By that I mean that gas as an industrial fuel allows for complete control of both the physical and chemical characteristics of each and every heating operation. In bringing out this thought let us analyze the methods which we utilize for the progressive development of our industrial processes.

We are living in an age when the character of our industrial heating processes is fast emerging from the category of an "art" to that of a "science." The average heating process today is no longer dependent upon the traditions of the past and the intuition and general skill of the workman. The great progress we have made and are making is due to scientific control—the development in our research laboratory of scientific methods which definitely prescribe the physical and chemical conditions under which we can obtain the highest quality standards of production at the lowest possible cost.

The Importance of Research Work in Iudustrial Efficiency

Is it not largely true that our great improvements

*Address before Rhode Island Chapter, American Society for Steel Treating, at Providence, R. I., December 19, 1923.

are developed in the research laboratories? Is it not the developments in the laboratory of the average industrial company that attain the zenith of perfection in regard to each and every process? Today the progressive industrial organization has a research laboratory which makes a very careful study of its various heat processes and prescribes those conditions under which different materials can be heat treated to obtain the highest quality standards of production with the minimum spoilage, together with the maximum economy involved.

With these results in hand, it would seem an easy matter to apply these data to the commercial operations of any plant and obtain the same desirable results. This is not the case. The reason for this seems to be that we have not been able to work out methods of control in regard to our large industrial furnaces along the same lines as we have been able to control the physical and chemical conditions of our small experimental furnaces in our research laboratories.

Reasons for Lack of Control

This lack of control on a commercial scale has been due to several reasons, the fundamental reason being our inability to control the combustion of our fuel in such a way as to definitely regulate at all times the furnace temperatures, uniformity of heat application, furnace atmosphere, and the other considerations necessary. This lack of control has been primarily due to the great difficulty involved in mastering the technique of efficient combustion and uniform heat application of our solid and liquid fuels.

Gas as a Fuel Is Scientifically Correct

Gas is the ideal industrial fuel because the development of its heat energy and the application of that heat in any heating process can be most accurately controlled. Gas delivered at a furnace is in the proper condition for its immediate conversion into heat energy.

The factors necessary for the complete combustion of gaseous fuel are known. The manner in which a fuel should be applied to obtain practically any condition desired is also known. For these reasons it is an easy matter, because of the means we have for temperature control, very definitely to regulate the furnace temperatures desired. By proportioning the correct amount of air for the combustion of our fuel, we can obtain those atmospheric conditions in a furnace which are necessary for the highest quality standards of production. The other necessary conditions, such as uniform temperatures and desirable rates of heat transfer, are readily obtained.

Gas and Electricity Two Fuels That Can Be Adequately Controlled

If we make a survey of the industrial fuels available today, we find that there are just two which satisfy this important factor of "control." These two mediums are gas and electricity. From the scientific standpoint and from the standpoint of effective utilization, these two fuels are correct in principle. However, the fuel which will ultimately be adopted as the universal industrial fuel must not only be scientifically correct, but the economics involved in its production, manufacture and distribution must be considered.

Electricity as an Indutsrial Fuel Is Economically Unsound

From an analysis of these economic considerations, I cannot help but feel that a greater use of electricity for industrial heating operations is greatly limited. When we take into consideration the fact that electricity today is produced from coal at a thermal efficiency of only about 10 per cent, we realize the great waste which takes place in using this medium for heating purposes. When we consider the fact that we first develop heat energy from the coal, then convert this heat energy into mechanical energy, then into electricity, and then turn this electricity back into heat energy, we can realize how unsound, how unsubstantial, how uneconomic, the use of electricity as a fuel must be.

No Assurance of Production of Electricity at Lower Cost

Furthermore, we have available no definite assurances that we shall be able in the future to produce electricity at much lower costs than we do today. The recognized authorities of the electrical world claim that with the greatest innovations of equipment known today, the best we can expect from even a superpower development is an overall thermal efficiency of some 18 per cent. Certainly this figure does not justify us in considering electricity as the ultimate solution of our industrial fuel problem, especially when we consider the high possible thermal efficiencies with which we can produce gaseous fuel from low grade coals.

The Electric vs. the Gas Furnace

At this point I should like to say a word about the electric furnace. It is true that the electric furnace has made tremendous progress during the past few years and that it will make considerable progress during the next five or ten years. The reason for this has not been because electricity is the best fuel available and represents the ultimate solution of the problem, but because the electrical industry has been first to realize the great achievements that could be accomplished in the industrial heating field. To be exact, the electrical companies have carefully analyzed the factors involved in any heating operation and have developed a furnace, considering at all times the characteristics and the qualities necessary to perform those heating operations under the most desirable and at the same time most economical conditions.

The Brass Melting Problem

For example, let us take the problem of brass melting. The electric companies got at this problem in the right way. They carefully studied the various requirements of efficient brass melting, involving the homogeneity of the metal, uniform heating of the brass without superheating, the minimizing of appreciable metal losses, the proper atmospheric conditions necessary in a furnace for brass melting, and other requisite conditions. With this information in hand, a furnace was designed which provided for absolute control of the heating operation, with the result that the highest quality standards of metal melting were obtained with the minimum of cost.

The electric companies, by working together with the manufacturer, by first studying the problem from the scientific standpoint, and then developing the right kind of heating appliance for that work, succeeded in developing a number of furnaces which have resulted in giving the industrial plant an improvement and an accomplishment both from the standpoint of better quality and lower cost of production.

Use of Electricity Cannot Become Permanent in Industrial Operations

There is no question that the electric companies have rendered a very valuable service to the industrial heating world and that they should be complimented for this splendid work because they have given the manufacturer something better than he had before. While this is all true, we cannot help but feel that from the basic and economic standpoint, this is only a temporary condition. Perhaps this can best be brought out when we realize that the cost of electric energy runs three to five times greater than that of high-grade gaseous fuel, and fifteen to twenty times greater than our other solid and liquid fuels.

The progress of the electric furnace is not due to the fact that the electric furnace is fundamentally correct, but because the fuel-fired furnace was relatively so inefficient that the electric furnace, in spite of the almost prohibitive high price of electricity, was able successfully to compete with the inefficient fuel-fired furnace from the economical standpoint.

The electric furnace as a general industrial heating appliance is only temporary, and will cease to be the economic solution of the problem as great developments take place in the realization of cheaper methods of gas production and better furnaces for its utilization.

Gas Is Economically Correct

Gas as an industrial fuel is not only fundamentally correct from the scientific standpoint, but it also satisfies all the economic considerations involved. In regard to the raw materials available for the production of high-grade gaseous fuels, we have unlimited supplies. Generally speaking, our coal resources in this country on the basis of our annual requirements are sufficient to last us three thousand years.

The development of efficient gas manufacturing process is only in its infancy. However, even today the methods, used by our central stations gas companies, operate on an overall thermal efficiency of from 50 to 80 per cent. During the past few years a great development has taken place in the working out of efficient and economic methods of producing high-grade gaseous fuels under very economical conditions. This entire development is just in the stage of realization, and we have very definite assurances that within the next few years methods of producing high-grade gaseous fuels will be commercialized so that public utility gas companies of the United States and other countries will be in a position to supply gaseous fuels to the various industries in their communities at prices as low as one-half to one-third of the present prices.

Gas Will Ultimately Be the Desirable Fuel from Every Standpoint

What I have specifically in mind are the great accomplishments that are taking place in working out methods of fuel processing, methods of low temperature carbonization and complete gasification, which will recover the valuable by-products of our low-grade coals and at the same time convert the bulk of the fuel into a high-grade gas, suitable for the performance of all heating operations. Not only is gaseous fuel highly desirable from the scientific standpoint, but we have every assurance to believe that, as time goes on, its cost will become lower and lower, so that ultimately it will be the most desirable and economical fuel from every standpoint.

A Fuel Service by the Central Station Gas Plant

Let me just say a word as to the service the central station gas company can render in supplying industrial gas to the manufacturer. The great bulk of our manufacturing plants do not use more fuel than the equivalent of fifty tons of coal per day, and from the study of the economics involved it is easily realized that it is very undesirable and very wasteful for a small industrial plant to build its own gas producing equipment because of the fact that it must necessarily have high fixed charges, due to standby equipment, and that the operating charges must be necessarily high, due to the relatively large amount of labor and other requirements necessary.

Ultimate Solution of Fuel Problem Lies in Central Station Gas

While the larger industrial plants of the country will find it desirable to have their own gas producing equipment, I believe that you will agree with me that the most desirable thing and the ultimate solution of the problem lies in the direction of having the fuel requirements of the average industrial plant supplied by some central station gas producing organization.

As I see this problem, the public utility gas company of today will become the institution in each and every community which will supply all the heating

(Continued on page 684)

Why Coal Takes Fire Spontaneously

Applications of Theoretical Reasons for Same to Practical Coal Storage

O. P. Hood, Washington, D. C.

Chief Mechanical Engineer, U. S. Bureau of Mines, Mem. A. S. M. E.

This paper discusses the phenomena incidental to the self-heating of coal when subjected to change in environment and analyzes the effect of the self-heating on the piling of coal. The author states the fundamentals to be observed in storing coal with the minimum danger of spontaneous combustion.

IN ORDER that the engineer may intelligently consider the phenomena of spontaneous combustion of coal, he must receive from both chemist and physicist some general ideas about the coal substance, about the character of coal surface, about the atmosphere in which it may be immersed, and about slow combustion. The coal substance is extremely complex in its chemical relations. Carbon, hydrogen and oxygen products of fairly definite chemical combination have been brought together in ages past under conditions where rearrangement, exchange and elimination of elements have progressed at first rapidly and then at rates infinitely slow, until a practical equilibrium has been attained in the substances we find in the ground as coal. Change the surrounding condition, however, and recombinations may begin again. These may be very slow at normal temperatures, but at elevated temperatures they are rapid, and we call the process combustion.

A particle of coal within the mine has for its immediate neighbor a similar particle with which it has exchanged molecules, perhaps, and suffered common losses, until further reaction has practically stopped. This particle, removed from the mine, is surrounded by air from which it had been shielded for ages. and its moisture, temperature, and pressure environment become different.

We should expect considerable variation in coal, since the original vegetation from which it came varied in composition and was laid down in varying proportions, and its environment through the long ages has differed from place to place. Therefore, the final equilibrium attained must be different in each case, and we have our anthracite, our bituminous, and our lignite coals.

Atmosphere Reacts with Freshly Broken Coal

When mined it is the freshly broken coal surface that experiences the greatest change and which finds its equilibrium most seriously upset. The boundary between the coal and the air looks smooth, perhaps, but when we apply the conceptions of the chemist the surface must be a jungle in which gas molecules become entangled, condensing on the surface in great numbers. The surrounding atmosphere may carry not only nitrogen and the active oxygen, but also vapor of water and other gases. The temperature will also change. Powdered coal sealed in a bottle with air gradually takes the oxygen of the air into combination, reducing the pressure in the container. Some CO_2 is formed, but not enough to account for all the oxygen. There is slow combustion, as we know it, and other reactions less definite and less stable.

Various loosely held oxygen relationships are established on and in the immediate surface. Some coals will take up as much as 6 per cent in weight in this process. Entertaining this point of view, it is not surprising, therefore, that there is an attempt to re-establish chemical equilibrium at the fresh surfaces, and that in these recombinations heat may be given off. Small amounts of heat may be generated in other ways. With the coal substance are minerals, and these also find themselves in strange environment and proceed to change. Heat may be generated from other than chemical rearrangements. If very fine silica sand be slightly moistened with water, heat is generated. There is no chemical change, but the deposition of moisture on the great extent of curved surface in some way generates a small amount of heat.

Freshly Broken Surface of Coal Is Chemically Active

To sum up, we can expect a freshly broken surface of coal to be chemically active in some way seeking to establish equilibrium under new conditions. The amount of the activity will vary with the particular coal, the amount of surface, and the environment. It will be rapid at first, and finally be so slow as to pass out of our interest. These changes may develop heat; they may add to the weight, and may finally reduce the weight by inducing combustion. The principal source of heat is the coal substance itself, whatever may be credited to the usually small percentage of associated minerals. Being a surface phenomena, it will become noticeable only when the surface is large.

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*Contributed by the Fuels Division for presentation at the annual meeting, New York, December 3 to 6, 1923, of the American Society of Mechanical Engineers.

In Changing Environment, Coal Is Self-Heating

The rate of these chemical readjustments is greatly increased with increase of temperature. Chemists say that, generally speaking, the rate of chemical combination doubles for each 10-deg. rise in temperature. Coal at ground temperature, when removed, is apt to be sent into warmer suroundings. If the surroundings are such that the heat generated cannot escape, the process becomes self-aggravating, with an increasing acceleration, so that very small heat quantities following this law in time become large. As the temperature rises new reactions also become possible, involving other constituents of the coal substance.

J. D. Davis, of the Bureau of Mines, has devised an adiabatic calorimeter which provides an environment for coal which follows exactly the momentary temperature of the coal. Fine coal through which oxygen of the same temperature is made to flow rises gradually in temperature from 150 deg. fahr. until a critical point is reached, when the temperature rise is greatly accelerated. There is an elbow in the plotted temperature curve. This critical point is different for different coals, but is around 185 deg. fahr. In this device coal can be caught in the act of self-heating, rates can be plotted, and comparisons of behavior made.

Loss of Heat From Coal Surface

When a coal surface is elevated in temperature above that of its surroundings it will lose heat by conduction, radiation, and convection. The body of the piece will itself be heated by conduction. Obviously, if the mass is large compared with the surface, as in coarse coal, the rise in temperature of the mass will be small as compared to the condition of fine coal where the total surface is large compared to the mass. Radiation at these small temperature differences is a small factor in the case. Convection is believed to play a considerable part in the problem. Air, vapor and gas currents normally move across a coal surface, removing heat and carrying it elsewhere, and a temperature equilibrium is soon established at a slight elevation above that of the surroundings.

Current Phenomena in a Pile of Coal

In a pile of coal these movements are usually present. From 25 to 45 per cent of the volume of a pile is void spaces between coal particles, through which a comparatively free movement of air is possible when the pieces of coal are of appreciable size. A light wind pressure would change the air in the pile many times daily. If, however, the particles are quite small, although the void percentage may be the same, the resistance to flow of air would be great, and much less exchange of air and heat removal would follow.

The ordinary daily barometric and temperature changes produce a breathing in such a pile that would exchange air, and if any portion becomes perceptibly warmer a chimney effect is also possible. These vagrant air movements within a pile are beyond computation, prediction, or practical measurement, but their existence determines largely whether we shall have a dangerous heating in a pile of coal or not. If the movement of air be reduced to zero, the oxygen is soon completely engaged with new relations and the very small rise in temperature is stopped.

If there is a considerable movement of air, any heat generated is carried away. There is, therefore, some rate of air movement too slow to carry heat away, but sufficient to keep up the supply of oxygen and produce the maximum heating effect. The problem of coal storage is to prevent this condition, or, if it exists, to discover it before a critical temperature is reached, and rearrange and cool the particles at the local point of heating.

Coal Piles Present Peculiar Ventilation Problem

A conical pile of run-of-mine coal made by dumping from one point will have a central core of small-sized particles. Air exchange through this will be extremely slow. With such handling coal sizes are classified, and will grade from the finest in the center and top to the coarsest on the bottom and lower flanks where there is ample ventilation. Between these extremes, part way up the flanks and below the surface, there is likely to be a most favorable condition for spontaneous combustion, where the coal is fine enough to give a large surface of fresh broken coal and the ventilation too low to carry away the heat any yet sufficient to keep up the oxygen supply. The hazard is thus greatly increased by allowing this classifying action in building the pile.

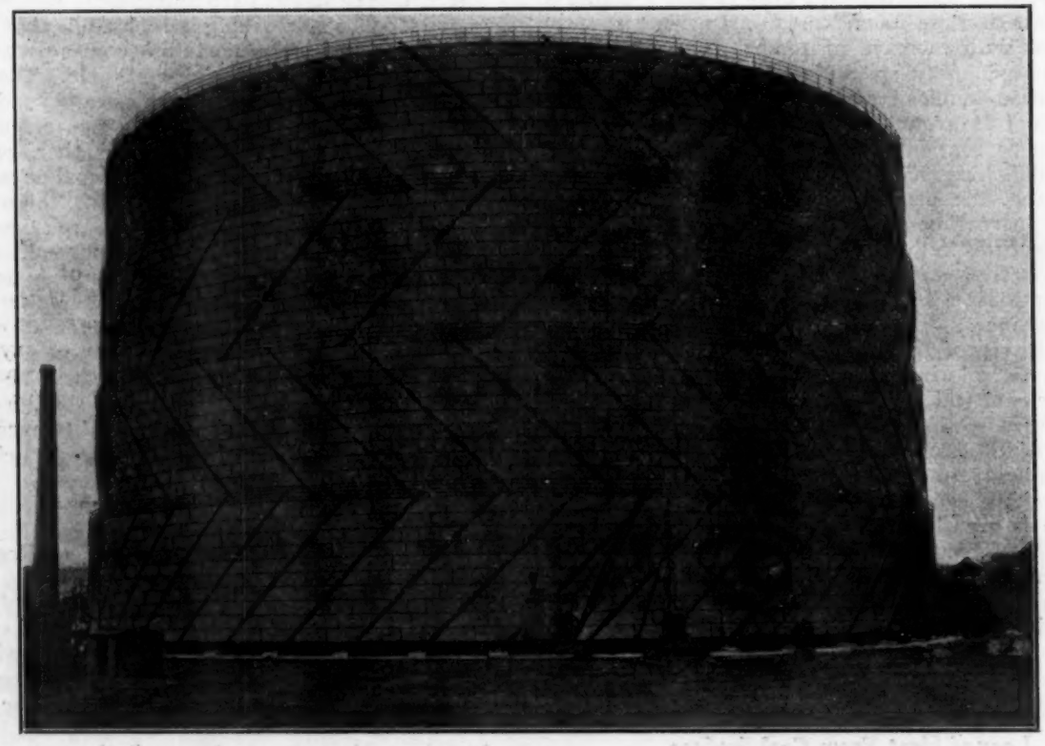
Role of Moisture

The part that moisture plays in this problem is of interest. A distinction should be made between the moisture considered by the chemist and moisture as known to the operating man. In the one case water vapor may play a part in the chemical drama, perhaps being necessary to some reactions, and enter into the problem of swelling mineral crystals that break up the coal into finer sizes. To the operating man moisture means something he can see, a heavy rain on a car of fine coal, or perhaps drenching a pile of coal to cool it off. The latter effects are believed to be largely physical and mechanical. Fine coal will hold 15 or 20 per cent of free water, and such coal is practically impervious to air currents. The locomotive fireman wets his fine coal in order that the draft shall not at once blow through the coal.

Danger of Sealing in Wet Coal

A dry pile which may be sufficiently ventilated

(Continued on page 685)



World's Largest Spiral-Guided Gasholder

Northern Ireland can now boast of having in operation the largest spiral-guided holder in the world. In the matter of capacity, spiral-guided holders have moved forward somewhat leisurely, though the system has had such large trial in holders of the lower capacities, and under a diversity of stress conditions reaching from normal to the most critical experienced.

The New Holder

It has brought the spiral-guided type of holder closer up to those column-guided ones that are of the first magnitude, but the number of which is small that exceed in capacity this four-lift seven million cu. ft. spiral-guided one.

This capacity about doubles that of the largest of the holders of this type previously erected. The advance will make the competition the keener between the two common types of construction, and later on possibly between them and the tankless form of holder. The fact that the holder, fully inflated, has operated as steadily in the recent great storms as it does in calm weather, is good proof of the soundness and accuracy of both design and structural work.

*From the Gas Journal.

Description of the Holder

The tank for the new holder is of brick and puddle, 252 ft. 6 in. in diameter by 37 ft. deep; and though springs were found in various places, it is satisfactory to know that the tank is perfectly tight.

The gasholder, which consists of four lifts, the outer lift being 250 ft. diameter by 36 ft. 6 in. deep, and the inlet and outlet pipes 48 in. diameter. The inner lift gives a pressure of 5½ in.; and the crown being untrussed, an additional weight of about 100 tons was secured to a stiffening girder placed round the foot of the channel-iron cups. Each lift was provided with a circular girder to insure the lifts being maintained in true form.

The vertical stays throughout were kneed, and secured to the inside of the cups, and the footplates, forming stiffening brackets in each case, and cast-iron blocks were fixed to the underside of the dips, to distribute the weight equally round the circle. The crown was given a rise of 18 ft., having large crown sheets, 10 ft. long, radially fixed. The support for the crown is on the "Bearscot" principle of continuous circular bracket bars, carried upon brackets secured to ferro-concrete piers.

(Continued on page 687)

Activities at the Public Service Company of Colorado

Customer ownership campaigns--Window displays

J. B. Dillon

For some time the daily papers of Denver and surrounding cities have been carrying illustrated advertisements of the Public Service Company of Colorado, the word pictures telling of the stock to customers idea, soon to be inaugurated.

Some of the "pointers" from an equipment standpoint are: Four electric generating plants; 192 miles of high tension transmission lines; nine electric distribution systems in as many cities and towns, representing 1,053 miles of electric lines; two gas plants and 430 miles of gas distributing mains in Denver and Cheyenne; two steam heating plants and 6.3 miles of steam heat mains in Denver and Cheyenne. The steam heating plants supply many buildings with the only source of heat they have. The buildings that receive this service are always well heated, the writer can testify by personal contact.

Letter Sent to Every Customer

The inaugural day was November 8, every customer of the company receiving a letter from the company, excerpts therefrom being:

To make every customer a part owner, and a profit sharer, the company offered 10,000 shares of its 7 per cent cumulative preferred stock at $93.50. The limit to any one customer is twenty shares. Shares will be sold at $10 down and $10 monthly. The yield will be 7.49 per cent, stock callable at $110 and accrued dividends on forty-five days' notice, dividends to be paid monthly, and the stock is non-assessable.

The Pictures

There were many; all were good, but the one that seemed the best to the writer depicted a billboard, the face of the board being a replica of the stock certificate, the caption being: "Behind Your Investment." One man was peeping behind the billboard and there he saw a large power plant with smoke coming from its stack. Great, isn't it? You bet. While he saw the power behind his investment two others were reading the sign.

Another picture showed a man in overalls pointing to a power plant and saying: "I own part of that." Then there were pictures of a crowd, in line, at the cashier's window, to receive dividends; men seated in the banker's office using the stock for various business transactions.

The whole lot of pictures deserve special mention, likewise the word paintings, but space does not permit.

While the main office of the Public Service is the principal selling point of this good stock, all the big banks of Denver are handling it, proud to serve the giant industry of the State, an industry that has helped to make the State, and glad to be able to say to bank customers that here is a stock that they are proud to buy and sell, because it is better than a gold piece not in action, for this is gold in action.

In the Show Windows

The Gas and Electric building has splendid show windows, on both sides of the building, which is situated on the corner of Champa and Fifteenth streets. Here are some of the attractive features we found within the windows:

A large map depicting the territory the company serves, and to a thinker this alone should prove a silent salesman for the stock. This map on a white background was done in red and black and easily legible.

The window nearest the Fifteenth street corner entrance had a large picture of the Gas and Electric building, a picture of Miss Colorado—a beautiful woman—with outstretched arms holding the framed building, as much as if to say: "Behold, this is my pride," and then, leading from the building were yellow silk threads (streamers of gold), the ends of the cords tied to the miniature designs of men, women and youths, young, middle-aged, old aged, rich and poor, yet all held a share of stock within their hand and a money bag alongside.

Was ever anything done more thoroughly? Isn't that psychology personified?

One of the windows near one of the Champa street entrances held a large frame. In the center was a stock certificate and all around were checks for a border.

Look where you might, you were confronted with a reminder that now is the time to invest your money where it is safe and will reap the greatest return.

While I was taking all this in, my eyes could not escape the glaring big banner reading: "Big Reduction on Gas Ranges While Our Stock Lasts," and then a window nicely arranged with incandescent lamp reflector shades, any in the window going at $1.15, and I know that many like them have sold at the gas and other buildings in town for three and four times that.

Pomona Not Forgotten

Pomona, Queen of Fruit, is proud of her Colorado apples, and, as this is apple week in Colorado, the gas company displayed a choice variety and a card sign: "Buy a Box of Apples." No, the company was not selling apples, but merely lent their aid in encouraging the dealers, and reminding the consumers.

(Continued on page 687)

Religion and Business--Good Mixers

Says gas manager and Sunday school teacher

In a recent issue of your good paper, I read, with abundant pleasure and satisfaction, the article written by Mr. William H. Ridgway on "Religion and Advertising."

How seldom, and regrettably so, do we mention religion in our trade papers.

Without question of doubt, religion is quite as valuable an asset in public relations as in advertising.

The writer is a Sunday school teacher, known and respected as such by his acquaintances and associates.

During the war it was evident that my company was in need of financial relief, and so we appealed to the local council, who demanded figures and facts, which we gladly furnished.

After the third conference with that body of men, they frankly told me this: "If you say that these figures are absolutely correct and correspond with your books, we will take your word for it, but we would not believe the officers of your company in anything they present."

In less than eight months it was necessary to make another appeal for help. Without examining our books, which I very cordially invited them to do, they granted us the second increase in rates.

It does pay to be, as Thomas Edison recently said, "a believer in the religion of our Lord and Master."

We as gas managers have a splendid opportunity to train young men in the Sunday school to become valuable employees for our organizations.

A young man, a Sunday school teacher, moved to a new town, and, very desirous to continue his valuable services as a Sunday school teacher, applied to the Methodist Sunday school for the opportunity. The superintendent told him he thought that to grant such a favor would be impossible in view of the fact that the applicant was a Baptist. The pastor of the church learned of the man's request and invited him to the Sunday school as a teacher, with the understanding that he go out and round up some boys who were not in the habit of attending Sunday school.

This man brought in four young fellows and taught them for years. The teacher is now an old man and declares that from the time those young men left him to go out into the world to follow their chosen pursuits they have never failed, to this day, to write him a letter, every year, on his birthday. Said someone, "Have they become successful men?" Said the old man, with pride and enviable joy, "That's the best part of it. One is a missionary in Africa; another a very successful man in New York City; the third is George B. Christian, who was secretary to President Harding." The recipient of this bit of news broke in, "Go easy, Dad, on the fourth; don't take my breath away." The old man's face lit up when he said, "The fourth was President Harding himself."

Do Religion and Business Mix?

Some say that religion and business do not mix well. It depends largely on the make of the mixer.

I am forty years of age, and in a few years that I have been manager of a gas company it has been my great pleasure to witness religion and business mix to the satisfaction of the gas consumer and all concerned.

Some might suggest that the religious man is religious primarily to succeed materially. To which I am frank to say that if one should ask a religious man where he was first prepared to be religious, he would confess, "In my heart."

His outstanding, straightforward religious career is not a forced advertising scheme nor an unpleasant task performed primarily to increase his sales, but because, first of all, he has a strong desire to help humanity.

You could find hundreds of religious men in business with a microscope.

When you say good-bye to friend wife in the morning and confer on her the responsibility of a careful custodian of your religion, and at your place of business sit all day on the fence, ready to flop either one way or the other, don't blame religion if the orders fail to come in with the desired rapidity.

Religion is that dynamic force which makes the blood tingle through the veins when you leave the doorstep in the morning with new ideas, new hopes, new inspirations and new courage to wrestle with the problems waiting on the bosom of a new oncoming day. Religion is that propulsion which forces a man to strain every nerve and muscle, to put into operation every available brain cell for the accomplishment of his given task with faithfulness, with accuracy and with dispatch.

Religion enhances the vision and unfolds the needs of an approaching generation.

Several Bishops called on President Roosevelt at the White House, and the spokesman introduced the callers as a bunch of preachers. "Bully," said the President, "so am I a preacher." Roosevelt never failed to express his religious convictions.

My brother visited Mr. Harding at his home in Marion just prior to his going to Washington as the chief executive. Mr. Harding took him aside and said, "Brother, I need to live close to God. I need the prayers of the people of the nation in this great task to which I have been assigned." His last writ-

(Continued on page 681)

The Therm System of Gas Payment

Some notes on the working of the new British system

F. Johnstone Taylor

BY THE end of last year most of the prominent gas undertakings in Britain had received orders from the government to operate under new conditions, and these conditions will, by the end of the current year, become operative practically all over the country. The majority of the undertakings have selected "declared calorific values" which are more or less in conformity with the heating value of the gas they have been in the habit of supplying for payment by cubic foot.

There was a tendency to play for safety and to declare a heating value below the average previously supplied. At a matter of fact, the Gas Light & Coke Co. has been supplying gas nearly 4 B. T. U. above declared value, the South Metropolitan Gas Co. nearyl 6½ B. T. U. in excess. Now several important undertakings have modified their standards.

Working of System Causing Trouble

Apart from this, the working of the "therm" system has caused a good deal of trouble in Britain. Instituted by the government in the supposed interest of consumers, it is the consumers themselves who are crying out loudly against it. The natural tendency of the gas companies to enrich the heating power of their gas with carbon monoxide has resulted in an abnormal number of gas poisoning cases of late. There is no limit, by law, as to its amount although there is a government order that gas containing carbon monoxide must "possess the distinctive pungent smell of coal gas." As a matter of fact, no gas is being supplied in this country which has a carbon monoxide content even approaching the 20 per cent safe limit, and the trouble therefrom is somewhat hard to account for beyond carelessness in respect of house fittings.

Public Objects to System

As regards actual payment under the new system, the public as a whole are up in arms against it. The gas companies, however, have made a pretty good case out for themselves. In the first place, they were at a public inquiry able to show that their profits were not abnormal, that the public did not understand the new system and would not go to the trouble to do so, that the system protects both consumer and producer and is a direct factor in the conservation of coal supply.

As a matter of fact, the main reason why, under the new system the consumers' gas bills have increased is, because it happened to be introduced just at the time when, mostly as a result of the coal strike in 1921, gas companies had to raise the price of gas, and the actual therm system of payment has had little or nothing to do with it. Nevertheless the public is so convinced that the gas companies have "put it across them" that the whole matter is under consideration by an impartial committee instituted by the London County Council, the results of which we hope to communicate in due course.

At present the prices of gas range from ten pence a therm in London (since reduced to nine pence by the South Metropolitan Co.) to five and one-half pence in the small town of Bath. There are on an average 5 therms to one cubic foot, therefore, 10 pence per therm is roughly 4s. 2d. per cubic foot. This is a fairly stiff price in Britain.

More Experience With System Required

On the whole, when the gas companies have obtained more experience of the new system, it will probably justify its introduction and lead to greater harmony between producer and consumer. The selection of the correct calorific value is most important. It is now generally conceded that with horizontal retorts the economical declared value is about 550 B. T. U. per cubic foot and when straight horizontal gas is mixed with blue (or slightly carburetted) water gas, 500 B. T. U. With vertical retorts the matter is more complex and depends to a great extent upon the proportion of steam which will give, in any individual plant, the most economical results and that depends upon the quality of coal normally utilized.

RELIGION AND BUSINESS GOOD MIXERS

(Continued from page 680)

ten message was an exhortation to the members of a certain fraternal organization to live close to the teachings of the Man of Galilee.

President Coolidge said recently, "We do not need more laws; we need more religion."

Does it pay to mix religion and business? Ask W. H. Ridgway or Bruce Barton.

Does it pay in the gas business? It certainly does. It imparts personal satisfaction, first of all, and, second, it brings home the bacon.

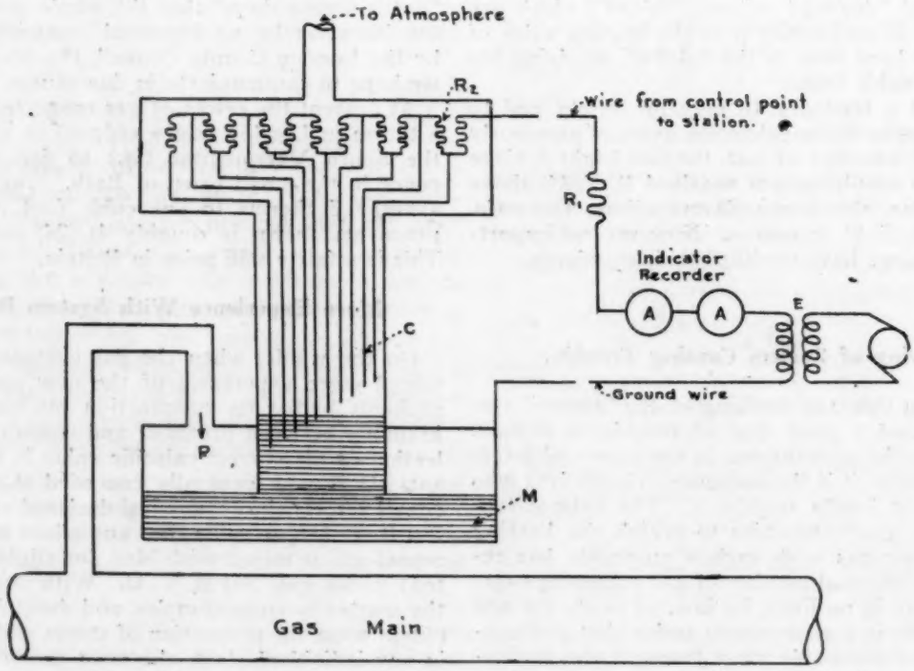
How many gas managers are there in the United States who are Sunday school teachers or officers?

Don't crowd, fellows, don't crowd. The secretary will get your names presently.

GAS WRINKLES

Long Distance Pressure Indicator

By C. A. Harrison, Denver, Col.



This device is intended to indicate the pressure in the mains at some point on the system on a chart located at some distant point. For instance, the pressure in the mains at the extremities of the distributing system to be indicated on a chart at the works to assist the operator in controlling the pressure and to do away with the necessity of operating on a predetermined schedule. In this device the pressure gauge is actuated by means of a variable electric current controlled by the introduction into the circuit of resistance proportionate to the pressure carried on the main at some distant point.

The instrument consists of a standard flow meter body installed at the control points in the system and connected with the indicator and recorder at the station through a metallic circuit, the indicator dial and recording chart being calibrated to read in inches of water and in any unit of range required.

The change necessitated in the meter body to convert it from a regular flow meter to a pressure meter was to eliminate the dynamic tube from the inside of the pipe and the substituting of a pipe to the atmosphere, thus measuring the difference between the static pressure within the pipe and the atmosphere instead of the differential between the dynamic and static pressures used in measuring flows. The resistance in the meter body is so designed as to properly cover the range of pressure required. A two-wire circuit with a 110-volt alternating current, with proper transforming to maintain a constant low voltage on the instruments has been found the most successful.

A pressure exerted from the main through the pipe "P" causes the mercury in the mercury well "M" to raise, thus causing one or more contacts to be made with a number of rods suspended into the contact chamber "C," thus cutting in or out a given amount of resistance "R_2," so regulating the flow of current through the circuit and the external resistance "R_1" and the electro-motive force at "E," the pressure thus being recorded in inches of water at "A" "A" the indicator and recorder.

As The Journal Views It

A RETROSPECT

The old year is nearing its end. A new year, 1924, looms on the horizon. The American Gas Journal desires to take this opportunity of expressing to the gas industry of the country its best wishes for a happy and prosperous New Year.

Moreover, the time is now opportune to look back upon what has been accomplished during the past twelve months, and to derive therefrom encouragement and impetus toward even greater accomplishments in the next year.

The American gas industry made real progress during the year 1923. In determining a development, or in measuring the degree of progress made in a great industry like the gas industry, every little act or thought initiated in a gas man's mind and converted into action, may be said to be responsible, in part, for the general advance of the entire industry. It is difficult many times to tell just where a certain movement received its first impelling force which finally resulted in a step forward for the entire industry. In considering what has taken place, it is generally very difficult to trace developments and to accurately assign the real cause of the same. Only the high spots are visible, and these are what must be considered in a retrospect, with due recognition of the fact that these are the high spots and the results of many individual efforts amplified and combined in a final decisive action.

The old year saw a number of such developments. The formation of an industrial section of the American Gas Association might be mentioned as one of the important developments during 1923. It was a sign of recognition by the gas industry, through the American Gas Association, of the importance of the industrial development in the gas business. It was due recognition of the importance of gas as an industrial fuel, which, as the industry grows older, may eventually assume greater and greater significance.

The year 1923 also saw a considerable development in house heating. This business is particularly able to increase, for, under the proper conditions, gas can supplant every other fuel that is being used at the present time for this purpose. The success which has been attained in certain Western cities with gas for heating homes and buildings should serve as an impetus toward the further development of this field in every section of the country. It must be preceded, however, by the attainment of proper rate conditions.

Perhaps the most noteworthy of the developments that took place during 1923 was the Colorado decision. In this decision the gas companies were relieved of the necessity of manufacturing gas of legally determined quality, but were told to go ahead and make the gas best suited to the conditions under which they were operating, and to charge equitably for the gas made according to its quality. The far-reaching importance of this decision was noted at the time it was issued, and in looking back, it now seems to possess even greater importance than was at first apparent.

It may be called, in fact, an act of resurrection. It loosened the bonds that have tied down gas companies in every state of the Union, which have forced them to manufacture a gas that legislators in their wisdom deemed best for the people. Legal restrictions have bound the gas industry with all kinds of unscientific and impracticable rules and regulations, and is still impeding the progress of the industry. Even in the enlightened Empire State, the Legislature saw fit to issue a decree not only increasing the price of gas, but increasing simultaneously the thermal value of same. In contradistinction to this new regulation, which is still being fought out in the courts, the Colorado decision is an act of really remarkable progress.

It is clearly the outstanding event of the year. It, like a torch, lights the way into the future. It indicates the path of activity for the coming year. It is a goal towards which each and every gas company in every state of the Union should be working. It shows just what can be done when a real effort is made. It is a remarkable monument to the enterprise and courage of the gas men, who, by their continuous efforts, were able to convince a public body of the desirability, from every standpoint, of permitting gas companies to make gas of such quality as they see fit,

and of trusting the companies to readjust their rates commensurate with the value of the gas sold.

Thus the gas industry has a definite aim to work for in the new year. It has the undeniable advantage of seeing this aim attained in a Commonwealth. It can point to this as a reason for Public Service Commissions in other states granting their request.

In the future, accordingly, there looms the spectacle of a gas industry in which each and every gas company is permitted to operate its plant to produce gas, not under artificially controlled conditions, but under the best possible operating circumstances, so that it can make its product at the lowest cost and sell it to the consumer to the best advantage of all concerned. This is a goal which the American Gas Industry should strive to reach!

GAS THE ULTIMATE FUEL FOR INDUSTRY

(Continued from page 675)

requirements of that vicinity. This will involve not only supplying gas for cooking purposes, as is done today, but the gas utility will also supply gaseous fuel for house heating, and gaseous fuel to the industries for the operation of all heating processes. To the industrial plant this will be a great service. A high-grade gaseous fuel will be supplied which will allow for the highest quality standards of production with the minimum of spoilage, and at the same time the price will be low enough to make the overall economics justified. Besides, the manufacturer will have the opportunity of devoting his time and energies solely to the operation of his own business and he will not be worried with the difficulties and idiosyncracies of operating his own gas producing plant and the trials and tribulations connected with obtaining a continuous fuel supply, maintaining storage facilities, etc.

The ultimate solution of the industrial heating problem lies in the service the central station can render to the manufacturer by taking the responsibility of supplying him with a high-grade fuel at the lowest possible cost and in quantities as required by the industrial plant.

The Development of More Efficient Gas Furnaces

This discussion so far has dealt primarily with the possibilities and ultimate status of gas as an industrial fuel. However, the progress which has been made in the past few years has been such that it is well worth while to say a few words in regard to the development of better furnaces, and the good work that the gas companies are doing in lowering the industrial gas rates and giving the manufacturer a fuel service.

The manufacturer of gas-fired furnaces has begun to realize the tremendous possibilities of gas as a fuel, and has succeeded in developing many lines of equipment which represent distinct improvements in the art. Furthermore, the high degree of efficiency that has been obtained with the electric furnace has given the furnace manufacturer a direct objective and an indication of what can be accomplished in the way of building a highly economical and efficient heating appliance, and I venture to say it will not be very long before gas-fired furnaces will be available on the market, which will not only be as desirable as the electric furnace, but will actually cost a great deal less in first investment and function with lower operating expenses.

I want to assure you gentlemen that a great development is taking place in the design of better utilization equipment. The result will be a gas-fired furnace which will allow for complete control of the operation and result in the highest quality standards of production with the minimum cost.

Even today, in practically all fields of metallurgy, equipment is available which represents great advancement in furnace design, and which proves more desirable from an economic standpoint than either coal or oil-fired furnaces, and in many cases the electric furnace. This is particularly true in the field of metal melting, forging and various heat treating processes of both ferrous and non-ferrous metals.

The Recuperative Furnace

In regard to this entire development, I should like to bring to your attention one innovation which is going a long way in improving furnace efficiency and economy, and which I believe is so important that it is only a question of time when each and every furnace will be equipped with this apparatus. This thought is the principle of recuperation—the method of utilizing the waste heat in the flue gases to preheat the air and oftimes the gas used in the heating operation. We only have to bear in mind that the average furnace operating at 2000 deg. F. allows more than half of the heat to go up the stack, to realize what great economies can be effected if we can return the major portion of this waste heat to the furnace to perform useful work.

There are several furnace companies today that are manufacturing equipment of this kind, using both refractory recuperators and metallic recuperators. These various equipments, generally speaking, represent a distinct advancement in the art: not only do they provide for greater efficiency in operation and general fuel saving, but the fact that preheated air is used for combustion, results in obtaining a flame of such characteristics, that more uniform temperature conditions are effected in the furnace, the temperature of the flame is higher, the production of the furnace per unit time is greater, and, generally speaking, the cost of production is reduced to a minimum.

In a practical way, these theories have been so well demonstrated that I feel you will be interested in allowing me to give you a few examples of what has been accomplished by recuperator furnaces during the past few months.

Greater Economy With Recuperative Furnaces

In a recent comparative test between an oil-fired

furnace and a recuperator gas-fired furnace, the gas-fired furnace showed a fuel saving of 27 per cent, a greater production of forgings per unit time of 25 per cent, and at the same time the number of rejected castings was only 12 per cent of that of the oil furnace.

A recent installation at Toledo, O., between a straight carbonizing and a recuperator carbonizing furnace showed a fuel saving of 38 per cent, and an increase of furnace production of 21 per cent. In applying recuperation to a heating furnace operated at 2000 deg. F., a decrease in fuel consumption of 50 per cent was reported. Again, a recuperator heat treating furnace recently installed at Battle Creek, Mich., resulted in reducing the cost per unit of product from $1.71 to 99 cents, indicating an actual saving in dollars and cents of 42 per cent.

These various examples are simply a general indication of the results that are being obtained, and I have taken the liberty of citing them in order to illustrate rather definitely just what can be accomplished in the way of better furnace efficiency and economy, by utilizing the modern methods of heat recuperation.

Lower Prices for Industrial Gas

Another factor in regard to the use of gas for industrial purposes which should be looked upon with interest by the industrial man is the work that the gas companies of America are doing in order to be in a better position to give the manufacturer an industrial gas service.

Due to the fact that the heating load of the average industrial plant represents a much higher load factor, or, in other words, is not nearly as intermittent as the domestic requirements of the average household, the gas company can afford to sell its product to the industrial man at a much lower rate than to the domestic consumer, because the various fixed charges are much lower in the case of the industrial gas demand. Consequently, during the past few years many of our more progressive gas companies have made radical changes in their rates for the use of gas for industrial purposes, in many cases reducing the gas 30 to 40 per cent of what it was formerly.

We are now in a period when the gas companies of the United States are beginning to realize that it is one of their jobs to sell gas for industrial purposes, and from present indications there is every reason to believe that within the next few years the majority of our gas companies will work out industrial rates which will allow the manufacturer to purchase gas at a price anywhere from two-thirds to one-half of what it costs him today.

Besides these improvements, the better methods of gas manufacture that are being worked out also give assurance of lower costs of gas manufacture, resulting in lower costs to the consumer. Taking into consideration the installation of proper industrial rates, together with the cheaper manufacture of gas, it is hardly beyond a question of doubt that the ultimate cost of gas to the industrial man will be no more than one-half of what it is today.

Gas—the Ultimate Fuel

As I see this entire activity, I believe the day is fast approaching when the Central Station Gas Company will deliver gas for all the heat requirements of the community, involving domestic househeating and industrial heating. Due to the use of better methods of gas manufacture, and the fact that gas will be produced and sold in far greater quantities than today, the price will be far below what it is at the present time.

This factor, coupled with the installation of industrial gas rates and the development of better utilization equipment, together with the general service that the gas company can give the consumer, will result in giving the manufacturer a fuel service which will allow him to carry on his operations under the highest quality conditions and lowest possible cost without any worry on his part as to the uncertainties of obtaining his fuel supplies, maintaining storage conditions, fire hazards, unsanitary conditions, etc. All the factors, including an adequate supply, quality, continued service, etc., will be taken care of by the gas company.

In closing, allow me to leave this message with you: Gas is the ultimate fuel, because from the fundamental and basic standpoint it is correct in principle. You can help in the more rapid solution of your fuel problem by first studying the science of your various heating processes, so that you can help the furnace manufacturer in understanding all the physical and chemical characteristics attendant to the successful operation of each and every heating function.

When you consider purchasing furnace equipment, try to be as fair as you can in considering the advantages of the gas-fired equipment, because this gas-fired equipment will ultimately be the solution of your heat problems, and all other apparatus that you install will only be of a temporary nature and must eventually be abandoned for a superior equipment.

In other words, I ask you to look to the future. Certainly there is nothing more satisfying to the manufacturer than to know that he has a fuel that will allow him to produce under the highest quality conditions and at the lowest costs, and at the same time that the fuel is permanent, and will, as time goes on, decrease in price rather than increase.

WHY COAL TAKES FIRE SPONTANEOUSLY

(Continued from page 677)

may be partially sealed if wet, and reduce the ventilation to a dangerous point. The conclusion often reached is that wet coal fires easier than dry coal, but the conclusion should be that the ventilation was so restricted by an impervious blanket as to furnish favorable conditions for the accumulation of heat. Putting water on a hot part of a pile only seems to furnish a good carrier of heat to other parts of the pile, and to disturb ventilation, unless large quantities are used and the pile drenched. Even here it is possible to have the under part of a large coal piece glowing while a heavy stream of water is shed from the top as from the roof of a house.

Practical Coal Storage

The application of these thoughts to practical coal storage lead to the following conclusions, which seem to agree with best current practice.

There must be no heat added to the coal from outside sources, such as hot walls, steam pipes, oily waste, etc. If coal can be got into the pile in pieces that will stay on a ¼-in. bar screen there will be no heating. The pile may be of any height provided there be no fines. Where mixed lump and fine coal must be stored the pile should be so built as to avoid segregation of sizes. The production of fresh surfaces by breakage just before going into storage, predisposes to spontaneous combustion unless the crushing is so fine and the packing of the pile so dense as to largely exclude air circulation. Coal should be so stored that its temperature conditions can be daily inspected. When any portion reaches a temperature of 140 or 150 deg. fahr. there is a high probability that within a few days or weeks a destructive temperature will be reached. If the temperature reaches 160 or 180 deg fahr., there is almost a certainty that a destructive temperature will be reached. The best remedy is to move the warm coal so that it may cool.

The possibility of quick removal should be considered in storing coal. This factor, rather than any tendency to heating, determines the desirable size of pile and height. The tendency to heat differs in different coals, and experience is so far the best guide in determining this difference.

Salient Figures of the Manufactured Gas Industry in 1922

Gas produced (M cubic feet):	
Coal gas	46,148,696
Water gas	210,252,585
Oil gas	24,763,793
Coke-oven gas	442,671,114
	723,836,188
Gas sold (M cubic feet):	
Coal gas	42,151,110
Water gas	193,543,286
Oil gas	21,736,446
Coke-oven gas	231,383,018
	488,813,860
Average price per M cubic feet of gas sold:	
Coal gas	$1.24
Water gas	1.15
Oil gas	1.06
Coke-oven gas	0.17
Number of active gas plants:	
Coal gas	353
Water gas	579
Oil gas	73
Coke-oven gas	64
	1,069
Fuels used in gas manufacture:	
Bituminous coal (net tons):	
Coal and water gas	4,311,359
Coke ovens	41,052,670
Coke (net tons)	2,602,672
Anthracite (gross tons)	864,834
Oil (gallons)	856,008,712
Average yield of coal gas per ton of coal carbonized (M)	10.7
Solid fuel used per M of water gas produced (pounds)	34
Oil used per M of water gas produced (gallons)	3.3
Oil used per M of oil gas produced (gallons)	6.6

Coke sold, by coal-gas plants:	
Quantity (net tons)	1,387,658
Average price per ton	$8.67
Tar produced (gallons)	
Coal gas	48,082,228
Water gas	97,232,985
Oil gas	7,322,043
Coke-oven gas	327,779,734
	480,416,990
Ammonia (sulphate equivalent) produced (lbs.):	
Coal gas	53,058,180
Coke ovens	898,465,061
	951,523,241
Crude light oil produced (gallons):	
Coal, water and oil-gas plants	3,943,623
Coke-oven gas	101,437,555
	105,381,178
Retort carbon produced at coal-gas plants (pounds)	609,347
Lampblack produced at oil-gas plants (pounds)	356,260,722
Drip and holder oils produced at coal, water and oil-gas plants (gallons)	3,541,613
Value of products of the coal, water and oil-gas industry:	
Gas sold	$298,492,290
By-products sold	17,373,080
	$315,865,370
Value of products of the by-product coke industry:	
Coke	$188,276,767
Gas sold	38,624,515
Other by-products sold	46,346,647
	$273,247,929
Total value of sales of products of manufactured gas industries, excluding by-product coke	$400,836,532

WORLD'S LARGEST SPIRAL-GUIDED HOLDER

(Continued from page 678)

Safety Devices on Holder

The guide carriages throughout are of the "Bearscot" four-roller all-steel type; the rollers being linked together on opposite sides. The cups and dips are 30 in. deep, giving a minimum seal of 10 in. when the holder is fully inflated; and the upper rows of plating on each lift are carried up, to prevent the paintwork of the holder being disfigured, and also to protect the water in the dip from wind pressure. Handrailing is provided round the curb and dips throughout, a continuous ladder is fixed from the tank to the crown, and safety stops are provided at the upper ends of the spiral rails. The latest system of anti-freezing appliances has been attached, and the whole of the riveting was carried out by pneumatic power.

ACTIVITIES AT THE PUBLIC SERVICE COMPANY OF COLORADO

(Continued from page 679)

In Memoriam

Armistice Day window showed a black wreath with a gold ribbon, crowning a pillar, a small American flag alongside, while to the right there was carelessly flung a larger flag across a chair, as much as if to say: "It's the vacant chair, but he died for His Flag, Your Flag, My Flag: Pro Deo Pro Patria."

Recapitulation

Oh, yes, the Public Service of Colorado is big and is growing bigger. You can see why, and you can see ways to emulate to as great or a smaller degree, but through it all you will see that success comes from right thinking and WORK.

A Set of Safety Rules for By-Product Plants*

8—When you finish a job leave the conditions safe, replace safeguards and do not leave loose material overhead or where men are liable to stumble over it.

9—Drill your men to notify you at once when injured, no matter how slight the injury may be.

10—A foreman's accident report must be made out for each and every accident, telling how the accident occurred and names of all witnesses. Also what caused the accident and how similar accidents can be prevented in the future. Ask this question of yourself: "Could I have done anything to prevent the accident?"

11—Investigate every accident occurring to your men and try to prevent another accident occurring in a like manner.

12—Never have a man in your employ with whom no one can talk.

13—Injured men should not be allowed to go to the doctor unassisted where the injury is other than of a very minor nature.

14—Foremen on one shift must report to and discuss with foremen on the other shifts accidents they have had with a view of preventing like accidents.

15—When it is necessary for men to work above other men, those working underneath should be notified of the fact. When it is necessary for men to work underneath other men, those overhead should be notified of the fact.

16—In the process of new construction or repairs, the surrounding premises should be kept clean and as orderly as possible. Boards with nails sticking up must not be left lying around.

17—No person should be allowed to operate traveling machinery of any kind without being authorized by the proper authority.

18—Make it your personal duty to see that all safeguards and signs, installed to promote safety, are in place and in good condition.

19—When repair men or men of other departments are doing work in your department, see that they observe all rules of safety. You are responsible for the conditions in your department.

20—Never send a man into a bin or hopper containing coal or other material unless he has the assistance of another man and a rope tied around his body under the arms. Be sure that the assistant stands in a safe place and has his end of the rope attached to some fixed object.

21—Do not allow loose material to lie around. A large percentage of accidents is caused by men stepping on or stumbling over material or objects which should have been removed.

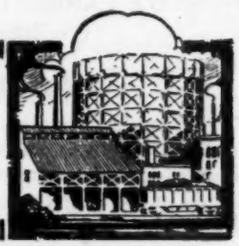
22—All fly wheels and large pulleys in your department should be inspected at regular intervals for possible defects or cracks.

23—Every foreman must know the location and use of the emergency medicine cabinet and its contents and their name, and know how to get the assistance of the regular doctor and hospital, and must know who to call if the regular doctor is out.

24—Never send a man into a tank, boiler, apparatus or vessel of any description without having a man outside to watch for his safety. If there is known possibility of danger, have him tie a rope securely under his arms before entering.

*Continued from last week as part of the paper presented by F. J. O'Malley, at the Twelfth Annual Convention of the National Safety Council.

NEWS OF THE GAS INDUSTRY



A. G. A. Plans for the Coming Year

With the recent meetings of the executive board and the managing committees of the various sections of the American Gas Association, the intensive program mapped out for the present year at the first meeting of the new regime, last month, is swinging into its normal stride.

The Committee on Co-operation with Educational Institutions has planned an extensive campaign to reach over the entire country. This committee is planning to have lectures given in all the leading colleges, universities and technical schools of the nation, and has arranged to have some of the most prominent men in the gas industry deliver these lectures. The cost of sending the lecturer to any school will be borne by the association.

A concentrated effort is being made by the statistical committee of the Accounting Section to ascertain from all the big gas companies throughout the country exactly what they are doing to gather figures on vital items in their business. They are also at work collecting figures from the many companies which will show the trend of business. The committee plans to make an analysis of forms and routines and to get from the individual companies a statement showing the purpose in mind for carrying on each piece of work along statistical lines. This committee will also endeavor to make a study of cost analysis in other businesses.

At a meeting of the section, Secretaries and Chairman of the Managing Committees, it was decided that the Commercial Section was the department to push the house heating end of the business. There was some question as to whether this work belonged in the Commercial or the Industrial Section, but an examination of the constitution of the association showed that this subject fell within the province of the Commercial Section.

Cities Service Co. in November

The gross earnings of City Service Co. for the 12 months ending with November 30, 1923, were $16,591,577 as compared with $14,564,749 in the corresponding period of the preceding year, according to the monthly statement of earnings issued by the company. In the same period net earnings amounted to $16,074,609, which compared with $14,125,234, and net to common stock and reserves was $8,473,792, which compared with $6,900,075 in the preceding 12 months. This was the equivalent of $18.25 a share earned on the average amount of common stock outstanding. In the preceding 12 months $14.82 a share was earned on the common stock. Preferred dividends were earned 2.70 times as compared with 2.40 times in the preceding year. In the month of November gross earnings totaled $1,181,824, which compared with $1,049,915 in October. Net was $1,143,132 against $1,011,711 and net to common stock and reserves was $508,257 against $376,110 in October.

Gas Plant Knocks at City's Doors

Harrisonburg, Va.—A gas plant is knocking at the doors of Harrisonburg.

This fact developed at the meeting of the board of directors of the Chamber of Commerce. A firm, with headquarters in Tampa, Fla., has submitted a plan to the City Council and to the Commerce Chamber. The plan involves the issuance of bonds, the amount of which was not made known.

It developed at the Commerce Chamber meeting that the Council has been quietly considering the proposal, but has taken no action on it on account of the bond issue feature.

The proposition went over as unfinished business in the Chamber's board of directors in order that a full discussion of it may be had before any action or recommendation one way or the other may be taken.

In connection with the discussion of this proposition and the idea of the city's purchase of the fair grounds as a new high school site, it was brought out that it is the plan of the City Council to turn its attention to improving the high school building facilities as the next important public improvement in Harrisonburg.

Installs New Booster

Elsinore, Col.—In order to keep the gas pressure at normal regardless of the greater or lesser amount consumed, the Elsinoe Gas Co. has purchased and is installing a $1,000 booster. With this new addition it will make no difference how much added pressure is demanded by the advent of cold weather, but will supply all equally.

Excavation Started for New Building

Dallas, Tex.—Excavating was started Monday for the foundation of the new Lone Star Gas Co. office building at Harwood and Wood streets. This building, four stories in height, will house the office of the gas company. It will cost about $175,000.

Old Colony Cuts Gas Price in Six Towns

Boston, Mass.—The Old Colony Gas Co. has cut the price of gas in six towns in which it does business, effective January 1.

According to a report filed with the Department of Public Utilities, this cut will affect the towns of Braintree, Weymouth, Hingham, Abington, Rockland and Whitman.

The new rate will be $1.10 for the first 100 feet used each month and 18½ cents per hundred for all over the first hnudred.

Oscar H. Fogg Elected President and General Manager of Baltimore Gas Appliance and Manufacturing Company

The board of directors of the Baltimore Gas Appliance and Manufacturing Co. announced the election of Oscar H. Fogg, retiring secretary-manager of the American Gas Association, as president and general manager.

Col. Fogg was educated in the public schools of Philadelphia. His first business experience was in a clerical position with the United Gas Improvement Co. in Philadelphia, and later as a cadet engineer, he received practical experience in gas manufacture, plant construction and gas distribution at Yonkers, N. Y., and other United Gas Improvement Co. plants in Westchester County.

Frof 1901 to 1902 Col. Fogg was superintendent of the Newton and Flushing Gas Company, at Flushing, L. I., and the following year he had charge of the construction of the gas works and distribution system at Ocean City, N. J., and of the operation of the plant on its completion.

The year 1904 saw the beginning of his employment by the Consolidated Gas Co. of New York, where he remained until 1917, when he entered the military service as a captain in the ordnance department. His first work with the Consolidated Gas Co. placed him in charge of the laying of 36-inch mains in New York City, and later he assumed the position of engineer ot the Department of Mains and Services.

In 1910 he was assigned to special work, including the investigation of gas-making processes and processes of combustion, the utilization of by-products, the valuation of plant property for court purposes, etc. During this period he made a study of methods for developing the utilization of gas in Europe and in the United States—a study of especial value to the commercial interests of the industry.

In 1912 Col. Fogg was appointed Engineer of Utilization, and organized the Department of Utilization of the Consolidated Gas Co. of New York and its allied gas companies, to the development of which he devoted his energies until called upon to enter military service.

He was a director and member of the executive committee of the Municipal Lighting Co. and a member of the various engineering and professional societies, among them the American Society of Mechanical Engineers, the American Society of Heating and Ventilating Engineers, the Society of Gas Lighting, the Society of Gas Engineering, the National Fire Protection Association, the Illuminating Engineering Society, the International Acetylene Association and the (British) Illuminating Engineering Society.

Col. Fogg was active in the work of both the American Gas Institute and the National Commercial Gas Association and was treasurer and a director of the latter when he entered the army. In 1913, representing the National Commercial Gas Association, he presented a paper describing its activities before a meeting of the British Commercial Gas Association in London.

He has been associated with the Bureau of Standards as a member of its advisory committee in the preparation of the National Gas Safety Code and served in a similar advisory capacity with the Industrial Commission of the New York State Department of Labor.

In September, 1917, Col. Fogg entered the military service as a captain in the ordnance department and was engaged in the design of plants and facilities for the repair and maintenance of ordnance material in France and in recruiting, organizing and training of enlisted and commissioned personnel for this purpose.

In France he was first engaged with troops on the construction of ordnance base shops, and subsequently appointed chief of the shop organization and maintenance section and placed in charge of organization, installation and operation of repair and maintenance establishments.

Later he was made chief of the construction and maintenance division of the ordnance department in France, the division which had supervision over all construction work and the operation of all repair and maintenance activities in the ordnance department in the American Expeditionary Forces, including the large base shops and the numerous smaller shops throughout France. Col. Fogg was honorably discharged from military service on March 31, 1919, with the rank of lieutenant-colonel.

Upon the recommendation of a special committee of the American Gas Association, consisting of H. C. Abell, chairman; J. B. Klumpp, C. A. Munroe, A. B. Tenney and the late F. W. Frueauff, the executive board of the American Gas Association, in May, 1919, unanimously elected Col. Oscar H. Fogg to the position of secretary-manager of the association. Col. Fogg took up the duties of his office immediately after his election, which followed close upon his release from the ordnance department of the United States Army. His resignation is to take effect on January 1, 1924, when he will take up the work of his new position.

Chickasha to Have Lower Rate

Chickasha, Okla. — Chickasha people will be burning Chickasha gas through a Chickasha line tomorrow, it was announced at the office of the Chickasha Gas & Electric Co.

The line from the field to this city is completed.

The line is 14 miles in length. Four miles of the line, starting at the southern limits of the city, was the original connecting line laid some two years ago, to connect the city with the trunk line of the Oklahoma Natural. The ten miles, starting where the connection with the Oklahoma Natural was made, is the new line just completed. The 14 miles of line cost the company $140,000, according to figures compiled by F. D. Shaffer, manager.

Every meter in Chickasha will be registering 42-cent gas in the homes and 17½-cent gas for the industrial users. The new rates show a reduction from a rate, the basis of which was 80 cents per 1,000 cubic feet.

Superior Meter Co. Moves to Larger Quarters

The Superior Meter Co. of Brooklyn, N. Y., moved their business from Bush Terminal building No 2 to Building 20, where they will have much larger quarters to serve the needs of their customers more advantageously.

Lighting Code to Be Put Into Effect

Boston, Mass.—According to announcement made last week by the State Department of Labor and Industries, a lighting code for industrial establishments adopted this year by the department becomes effective on January 1. It applies to factories, workshops, manufacturing, mechanical and mercantile establishments throughout the state. The statement says: "The purpose of the code is to prevent industrial accidents and to reduce eye strain, due to inadequate and faulty lighting. The code establishes minimum standard for intensities of illumination and provides for protection from glare, for distribution of light in working places and for entrance and exit lighting. Under the law, the Department of Labor and Industries is required to make reasonable rules, regulations and orders applicable either to employers or employees, or both, for the prevention of accidents and for the prevention of industrial or occupational diseaess."

Employees Association Holds Annual Meeting

Fitchburg, Mass.—The Fitchburg Gas & Electric Employees Club and Mutual Benefit Association had its annual December meeting and social on the night of December 18 in Chamber of Commerce Hall, with an attendance of 150 members and friends. There was a turkey supper, which was followed by a short business meeting. In the absence of President Edward B. Ryan, on account of the illness of Mrs. Ryan, Vice-President Walter F. Sammett presided. A telegram containing greetings of the Beverly Gas & Electric Employees Association, which was also in session at the same time, was received. The local association returned greetings to the Beverly associates through the Western Union Telegraph system. It was voted that the annual meetings in the future be held in April, instead of December. After the meeting there was an entertainment, consisting of singing by the Sunshine Trio, vocal solos and duets by Misses Senia Eskola and Gray Wray, Hawaiian selections by the trio, piano solos by Miss Wray and readings by Miss Alice Greene. The entertainment was followed by dancing until midnight. The social was in charge of Frank D. Powers, Edward J. O'Connor and Henry A. Bothner.

To Issue Stock

Concord, N. H.—Authority to issue $150,000, one-half common and one-half preferred stock, was given to the Keene Gas & Electric Co. and the Ashuelot Gas & Electric Co. to issue $60,000 common and $60,000 preferred stock, and $100,000 bonds, in orders issued on December 22 by the Public Service Commission. The Keene Co. owns the Ashuelot Co. The proceeds of the stock issues, in both instances, were to pay for construction work already done or partly done. In the case of the Ashuelot Co., the proceeds are to be used on expenditures incurred in the development of the large plant at Manawawa brook in Marlboro.

Permission Granted for Extension of Mains

Albany, N. Y.—The Public Service Commission authorized the Fulton Co. Gas & Electric Co. to extend its lines and serve the towns of Esperance and Schoharie under franchise recently granted by the town boards. The company supplies current in Cobleskill. The company is in a position to give service within a few months, and evidence upon the hearing showed that public convenience and necessity require the granting of the certificate to the Fulton County Company to operate in theses two towns.

New Mains for Worcester

Worcester, Mass.—To furnish better service to the residents of the Tatnuck section, the Worcester Gas Light Co. will install next spring a 20-inch main in May and Chandler streets connecting at Fairfield street with a 16-inch main extending from Ashmore road to Tatnuck in Chandler street. This construction will cost about $36,000. In this section of the city, which has gown rapidly, the flow has been inadequate during the periods of the greatest loads. With this construction the Tatnuck section will have satisfactory service for the next five years at least and at the end of that period the company, according to General Manager Edward H. Bauer, will have completed the high pressure loop about the city to feed the outlying sections and care for future growth.

Public Service Commission Authorizes Purchase of Property

Albany, N. Y.—The Public Service Commission, by order, has authorized the New York Central Electric Corporation to purchase the works, systems, franchises, property and assets, free and clear of all outstanding indebtedness, of Perry Electric Light Co., Warsaw Gas & Electric Co., Hornell Electric Co., the Dansville Gas & Electric Co., Yates Electric Light & Power Co., and Wayne Power Co. and the order further authorizes the New York Central Electric Corporation to make a mortgage and to issue under said mortgage $2,000,000 face amount of its bonds and sell same at 90 per cent of their face value to realize net proceeds of at least $1,000,000, and in addition to said bonds to issue $800,000 par value of its common stock and $889,500 par value of its 7 per cent cumulative preferred stock, yielding total net proceeds of bonds and stock of $3,489,500 and said proceeds to be used for the purchase of the properties of the aforesaid six companies and to pay for the cost of proposed new construction in connection with the tying in of said properties and other development of same amounting to $1,211,977.

The companies named as selling their properties to the New York Central Electric Corporation operate in that section of the state southwest of Rochester, and one of the companies, namely the Yates Electric Light & Power Co., has valuable water power rights which will be developed by the newly formed corporation.

Fifth-seven Prizes Awarded in 10th Suggestion Contest

The latest list of prize winners has been announced by the Committee on Suggestions, Philadelphia Company, Pittsburgh, Pa. The announcement of this list brings to a close the tenth Suggestion Contest, which was the second under the revised regulations which provide for rewarding every suggestion adopted in accordance with its value.

The highest prize awarded for this period is $50, which goes to Mr. V. G. Voland of the Treasury Department. A prize of $25 is awarded to R. D. Sherman, of the Engineering Department; one of $15 to N. A. Grier, of the Colfax Power Station, while R. E. Polk, Chief Industrial Engineer, and Miss Bessie D. Taylor, of the Telephone Department, each win awards of $10. Thirty-six prizes of $5 each were awarded, one of $4 and fifteen of $3, making a total amount of $339 divided among 57 suggestors.

The First Prize Suggestion

Following is Mr. Voland's suggestion which won for him the $50 award:

> Elimination of the names of consumers from whom cash security deposits on their contracts for service are received, from the general cash books, and in substitution therefor, the entry of the total amount of such deposits reported by each office at which deposits are received.

The result of the adoption of this suggestion are (1) the saving of considerable time by the bookkeeper; (2) the saving of perhaps 80 per cent of the space formerly required for these entries in the cash books; (3) permitting the earlier closing of the cash books at the end of each month and obviating the necessity of employing an additional bookkeeper whose services would otherwise have been required owing to a normal increase in the volume of business.

This suggestion embodies the idea of constructive thinking by the suggestor and indicates the development of the habit of looking below the surface of things.

$25.00 Class

R. D. Sherman, Engineering Department. Card index system be established and filed according to jobs showing complete information for each item of material ordered for each individual job.

$15.00 Class

N. A. Grier, Colfax Power Station. Sign as follows: "This being done as a result of an employee's suggestion. Send your suggestions to the committee," be placed on all work being done as a result of a suggestion.

$10.00 Class

R. E. Polk, Chief Industrial Engineer. Follow up system on complaints and service work.

Miss Bessie D. Taylor, Telephone Department. Ad department send copy of all ads to Telephone Department with dates they appeared in newspapers, so inquiries may be referred to the proper person.

$5.00 Class

Fred G. Rock, Brunot Island. That canopy be erected over steps leading from Power Station to foot bridge on Ohio Connecting Railroad Bridge.

L. N. Butler, Rochester Sub-Station. Have hand railing installed on wall on one or both sides of steps coming down from men's rest rooms to bottom of steps at Rochester Sub-Station.

R. L. Kirk, Engineering Department. Method for filing drawings in the Engineering Department.

W. H. Ferguson, Equitable Gas Co., Distribution Department. Two prizes. (A) New form of invoice for Equitable Auto Company; (B) Proposed form to be posted on front cover of automobile record book.

A. B. Walker, Accounting Department. After bookkeepers have put in previous figures on financial, comparative and general statements, they be turned over to stenographers to make up on the typewriter.

Frank M. Kenney, Commercial Development Department. Two prizes: (A) Sign be placed on desk in the center of hall on first floor Philadelphia building showing that contract and inquiry offices are located in the rear; (B) Every gas and light customer to be informed about our Inquiry Department.

M. A. Dillon, Equitable Gas Co. Substitute a rubber stamp for our guarantee form, utilizing the reverse side of contract for same.

Michael Scarpino, Underground Division. Folding frame of pipe covered with canvas to place around workmen when concrete is being broken.

F. W. Riffner, Distribution Department. All pole tops installed by Duquesne Light Co. to take care of Bracket No. 330 be drilled before installing.

H. H. Marsh, Jr., Sub-Stations Department. Tagging cables and conduits at Ambridge Sub-Station.

Harold S. Moore, Sub-Stations Department. Release arm on double release breakers be painted white, especially the "F" breakers.

Glen Donahue, Equitable Gas Co. District officers of gas company show the plate number from which sketch is made.

J. N. Calvert, Frick Sub-Station. Two prizes: (A) Guards be placed on the back of panels for Nos. 1 and 2 arc circuits at Frick Sub-Station; (B) Place a guard at the corner of pit in front of No. 5 boiler at Frick plant of Allegheny Steam Heating Boiler Room.

R. J. Clark, Accounting Department. Two prizes: (A) Notice be mailed to each domestic consumer advising under what rate they are being billed; (B) Accounting Department eliminate form 461 and make up three copies of punch form 33.

Charles F. Thomas, President's Department. Suggestion committee be increased by one member to be appointed from the Engineering Department.

Jay D. Fogg, Duquesne Light Co., Sewickley District. Two pole top switches be installed on Ambridge-Sewickley line, one on each side of South Heights Sub-Station.

L. L. Edwards, Rochester Sub-Station. Bell telephone be installed at Junction Park Sub-Station.

H. W. Correll, Secretary's Department. Duquesne Light Co. be shown on next telephone directory issued by Bell Telephone Co. for use of patrons in Beaver Valley.

John White, Accounting Department. Head of department request wage certificate be drawn in favor of employee and cashed by paymaster and carried on roll until end of month "paid."

John Lehman, Distribution Department. Use of ten-foot spoons and shovels instead of eight-foot shovels for digging seven and one-half-foot holes.

W. W. Bonnell, Engineering Department. Questionnaire in Public Service regarding company's activities.

C. A. Thorne, Power Stations Department. Button on each breaker that stops horn blowing after breaker has been opened be painted red and stop button be painted black.

W. M. Evans, Power Stations Department. Two prizes: (A) Double hasp be installed on all outdoor sub-stations; (B) Hole in floor for eye bolt and ring at Dravosburg sub-station be covered.

J. H. Harrison, Sub-Station Division. Linemen's name and time of reporting off and on high tension lines be written on switching order by station operator when received from system operator.

R. D. Sherman, Engineering Department. Inspector sent to factory to inspect cables be provided with tags to show material he inspects.

Jos. J. Kuenzig, Equitable Gas Co. Rubber stamp for approval of gas purchase agreements, leases, etc.

J. M. Rafferty, Underground Division. Notice in Public Service requesting employees to notify Service Board in case of trouble.

A. P. Foley, Colfax Power Station. Guards be placed around main hoisting drums at Gantry crane at Colfax.

J. C. McNiff, Purchasing Department. Watchman on first floor of Philadelphia building be supplied with postage stamps to furnish customers calling at the building in the evening to pay bills.

Miss Sophie Hieber, President's Department. Suggestion in regard to large inter-company envelopes.

W. L. Burton, Engineering Department. Drafting Division of Engineering Department block rear of all general drawings to save time of draftsmen.

$4.00 Class

H. W. Pohja, G. W. Quentin (jointly), Duquesne Light Co. Table for computing power factor be blue-printed or set in regular type and printed on white paper to be available to customers.

$3.00 Class

Wilbur M. Layton, Equitable Gas Co. Two prizes: (A) Advertising short talks with neighbors and friends; (B) Temporary cancellation dials where gas is off at the curb be sent to auditor promptly to eliminate minimum charge.

Herbert M. Mason, Underground Division. In order that there be a definite knowledge that all splicers have changed their book suggest that names of all splicers be written on the letter and when he makes change in book he shall make this note on bulletin.

Charles Luster, Accounting Department. That all district offices of the Equitable Gas Co. be furnished with a stamp bearing the name of their particular district.

J. A. Morgan, Underground Division. Stencils be made to read "post no bills," to be carried on trucks to stencil reels that are left on city streets.

J. M. Wachter, Contracting Department. On Equitable Gas Co. application forms line be printed as follows: "Date gas to be turned on."

John H. Lindner, Equitable Gas Co. When connecting up new table ranges that a tee be put on near the valve so a heater can be attached in cold weather.

H. W. Rush, Engineering Department. Roller be placed on end of table in Engineering Department to hold prints and play enough to permit prints to roll up easily.

W. J. Tyrrell, Brunot Island. Work order blank form W. O. 719 be changed.

George D. Spahman, Accounting Department. Switch plate be placed over exposed switches on pole in rear of Philadelphia building.

John A. Leister, Accounting Department. Report be made up periodically from miscellaneous accounts receivable ledgers of unpaid item up to time within sixty days of current date.

Henry C. Ivy, Brunot Island. Metal "No smoking" sign be placed on the paint pump at Brunot Island Power Station.

C. J. Madine, Treasury Department. Discontinue use of open blue envelope and white closed envelope be used in their stead.

Frank N. Fickling, Accounting Department. Rubber stamps be supplied to be used on jot orders where re-claims are provided for.

P. J. Tyrrell, Brunot Island. Cupboard be built and company install rubber coats, rubber gloves, gum shoes, etc., for operating men.

The suggestion committee in making the awards commented as follows: "It may seem to some employees that the opportunity of getting suggestions adopted is rapidly diminishing, because of the great number which have been submitted and the number of awards which have been made. This is not true, for the field is just as broad as ever. Often we think we have reached perfection in methods of conducting our business because they are familiar to us and because we have been told they are right or assume that an improvement cannot be made. New methods and new devices are constantly being adopted in every business. If your first idea has not gone over, try again and again. Submitting a number of suggestions shows you are watching your work and that you are trying to do something out of the ordinary routine.

"The committee is especially desirous of receiving the active and thoughtful co-operation of all employees in connection with labor saving devices. The labor shortage existing at the present time in the various lines of industry makes suggestions that may help to relieve this situation especially desirable. Doubtless many employees have practical ideas along such lines. It is hoped that all who have any such ideas will put them on paper and send them to the committee. Prompt attention and special consideration will be given all such suggestions."

Real Service Accorded the People of Troy

Troy, N. Y.—The Troy Gas Company is rendering an exceptionally fine service to the people of Troy, according to a local newspaper, not only in providing the means for carrying gas into their homes, but also in offering the very newest and most practical devices intended to make housework easy and at the minimum of cost.

We are no longer satisfied with sweeping our floors by means of the old-fashioned broom; we detest the odor of kerosene about the home and don't care to use it for illumination, for the old-fashioned lamp is no match for the light provided by gas—nor is in any way a saving of money. Many people too, have broken away from the old-fashioned oil stove for cooking purposes and instead are using the gas range, which is a wonderful improvement over the old way.

Great Improvements

All along the line are to be found great improvements in the manner of conducting the home. These improvements, be it known do not represent schemes to make money for their inventors, but are rather schemes to reduce the burdens of the housewife and to lessen the cost of maintaining the home. Surely these are worthy of the utmost consideration.

The Troy Gas Company specializes on its line of gas ranges, these coming in many sizes and prices some ranging low in price and others going as high as $100 or more. The line on display is complete and is made so with the idea of satisfying the tastes of every customer.

Then the Gas Company handles also the famous Humphrey hot water heater, which many families have considered a wonderful convenience.

The Troy Gas Company is certainly a big asset to the people of Troy. It is one of the biggest taxpayers in the city, gives constant employment to scores of men and women and pays ample wages for the services rendered. The company will also give ear to suggestions and it may be safely said that anything within reason will be done by it in order to render service to the people of Troy.

The company's salesroom in its beautiful building on Second street below Broadway, is always open to the public and to the public it extends a standing invitation to call and look over the many devices on exhibition there.

Inman Speaks to Gas Employes

Gloversville, N. Y.—About 75 members from Gloversville, Johnstown, Fort Plain, Cobleskill and Ephratah, of the Fulton County Gas and Electric Company, attended a monthly meeting of the employes' association in the Gloversville association.

The principal speaker, introduced by R. D. Davis, was R. B. Inman of Philadelphia, a member of the safety engineering department of the company. Mr. Inman's subject was "Welfare and Safety Methods" and he explained the methods of resuscitation and first aid methods of asphyxiation, gas, smoke, drowning and electrical shock. He also gave practical demonstrations of the work.

House Heating Rate Lower

Concord, N. H.—The Concord Gas Company has filed with the public service commission a gas rate applicable to house heating with gas. No such rate has previously been operative in the capital city, but the instalment of several all gas heating plants in Concord homes recently makes the departure at this time imperative.

The new rate will become effective August 1. It will figure: Gross, $1.25 per 1,000 cubic feet per month; discount, 10 cents; net $1.15. A minimum charge for the heating season, September 15 to May 15, has been established at $200.

Amends Gas Rate

The Cleveland Heights City Council has agreed to a new rate amendment giving the suburb the same gas rates as East Cleveland from August 1, 1923, until August 1, 1924. From that time on Cleveland Heights has been promised the same rates as Cleveland.

"We have not reopened the rate situation with any other suburb," Ralph W. Gallagher, vice-president and general manager of the East Ohio Gas Company, said. "I would not want to say that we could make the same proposition to all of them. A great deal depends on how much service we can supply."

The present Cleveland Heights rates run from 35 cents a thousand for the first 10,000 feet of gas to 80 cents for all over 30,000 feet, and were adopted more than a year ago in exchange for ten miles of extensions.

Oshkosh Plant to Have New Apparatus

The Wisconsin Public Service Corporation of Oshkosh, Wis., has placed contract with the Gas Machinery Company of Cleveland, O., for a seven-foot carburetted water gas apparatus, to be installed in the gas plant at Oshkosh, Wis.

This new water gas set is to be located in the building where the present one now stands and is to be complete with steam and air meters, explosion check valve, hand hydraulic control nest, pyrometer, overhead operating floor and auxiliary equipment.

The new water gas set will also be connected to the present waste heat boiler installation.

Kansas Company Would Reduce Industrial Gas

Topeka, Kan.—The Kansas Gas & Electrical Company, supplying gas to Wichita, Pittsburgh, Duncan and Hutchinson, filed an application with the Kansas public utility commission to reduce the price on industrial gas to its customers. The application requests authority to cut the price from 40 cents to 23 cents a thousand cubic feet on the first 500,000 cubic feet used in the month and to 25 cents a thousand on all industrial gas used above 500,000 cubic feet.

Installs Additional Equipment

The Austin Gas Company, of Austin, Minn., has awarded contract to the Gas Machinery Companyy, Cleveland, O., for a new five-foot Carburetted Water Gas Apparatus, and two purifiers, complete with auxiliary equipment.

The new water gas set will be located alongside of the four-foot six-inch set installed several years ago, when the gas plant was completely rebuilt.

So. California Gas Co. to Build New Headquarters

Los Angeles, Cal.—Ground will be broken soon for the valley headquarters office building of the Southern California Gas Company, which will be erected on East Sylvan Street, just east of the Pacific Telephone and Telegraph Company's exchange building.

The permit for the gas company's building was taken out recently and calls for one story and brick construction with an artistic front. The cost will be around $15,000.

The building will be a creditable addition to our city and especially to Sylvan Street, which is rapidly gaining prominence as a business street.

A Los Angeles firm has secured the contract for the work and the local representative of the company stated that it is hoped to have it completed within ninety days. The present location of the gas company's office in the Sutton block on West Sylvan Street has been outgrown by the force required to conduct the business in the valley. The new building will provide much more room, both for offices and for a display room.

Condensing System for Detroit

In addition to the carburetted water gas apparatus contract that it recently awarded to the U. G. I. Contracting Company, of Philadelphia, the Detroit City Gas Company has now awarded to that company a contract to furnish and install an eight-pass condensing system which will be capable of cooling 1,250,000 cu. ft. of gas per hour from 180 to 90 degrees.

This condensing system will be installed with the water gas apparatus.

New Rates Announced

Gloversville, N. Y.—Gas rates, effective at once and complying with an order issued by the Fulton County Gas and Electric Company have been announced as follows:

For the first 100 cubic feet of gas per month, 55 cents; for the next 4,900 cubic feet per month, $1.55 per thousand; for the next 5,000 cubic feet, $1.45 per thousand and for anything over 10,000 cubic feet per month, $1.35 per thousand. The minimum charge per month will be 40 cents per meter per month, which will be charged whether gas is being used or not, and a discount of 10 cents per thousand cubic feet will be paid back by the company within 15 days of rendition of bill.

L. C. Smith, manager of the company, said that the company's experts were careful neither to raise or lower the rates on gas, so that in effect the new rates are the same for everyone as they were when the service charge was in effect.

Gas Rates Raised by Two L. I. Concerns

Albany, N. Y.—The Public Service Commission has fixed the rates to be charged for gas by the Nassau and Suffolk Lighting Company and the Public Service Corporation of Long Island in the municipalities served by the two companies.

The rates fixed are subject to an additional rate of ten cents a thousand cubic feet if bills are not paid on the due date, not less than ten days after rendition. "The Commission," the order states, "reserves the right, on its own motion or complaint, to modify the rate ordered in the event that changed operating conditions make such a rate unjust or unreasonable to the public or to said company." The new rates were effective July 1.

The rate fixed for the Nassau and Suffolk Company is $2.05 a thousand cubic feet. That for the Public Service Corporation of Long Island is $1.95.

Pacific Gas Elects New Vice-President and G. M.

San Francisco, Calif. — The board of directors of the Pacific Gas and Electric Company have named Frank A. Leach, of Oakland, California, to succeed the late John A. Britton as vice-president and general manager of the company.

Mr. Leach has been engaged in public utility of work for the last twenty-five years, mostly under Mr. Britton.

U. G. I. Co. Increases Number of Directors

Four new vice presidents have been elected by the Board of Directors of The United Gas Improvement Company. This action increases the number of vice-presidents from five to seven.

Randal Morgan, who has been associated with the company for forty years, retires as vice-president and becomes chairman of the Executive and Finance Committee.

Walton Clark, who has served the company for thirty-five years, retires as vice-president and becomes Consulting Engineer.

Lewis Lillie, vice-president, will in addition assume the duties of general manager.

The new vice-presidents are: James T. Hutchings, who retires as general manager and becomes vice-president in charge of operation and of plants; G. W. Curran, who retains the title of secretary, vice-president in charge of accounting; J. A. Pearson, promoted from purchasing agent, who will be in charge of purchases, and F. J. Rutledge, promoted from manager, New Business Department, who will be in charge of sales of gas, electricity and appliances for using same. The other vice-presidents are Paul Thompson and Philip H. Gadsden.

William W. Bodine becomes assistant secretary and assistant treasurer. In addition to his duties as assistant to Vice-President Lillie, Mr. Bodine was also appointed secretary of the Executive and Finance Committee.

The positions of general superintendent and assistant general superintendent were abolished. Rollin Norris was appointed Gas Engineer, Paul Spencer, electrical engineer, and John B. Klumpp, inspecting and valuation engineer.

To Build $150,000 Boiler Plant

New Haven, Conn. — It was learned that the New Haven Gas Light Company will take out a permit within a few days to build a boiler plant at 347 Chapel Street; it will be two stories high and will have a frontage of 56 feet and a depth of 138 feet. It will cost about $150,000.

Three New Styles of Welsbach Heaters

Leaders for Next Season's Business

The influence of Welsbach advertising plus dealer enthusiasm have resulted this year in an unprecedented sale of Welsbach Heaters. For next season three new styles will be ready to increase Welsbach Gas Heater popularity.

The Nos. 29 and 27, equipped with andirons, and the new No. 31 have been designed to enable you to offer Welsbach efficiency, economy and convenience in every required size and style of heater. The complete Welsbach line will enable you best to put across to your customers the Welsbach message of "comfort plus economy."

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Backed by our Vast Knowledge and Experience

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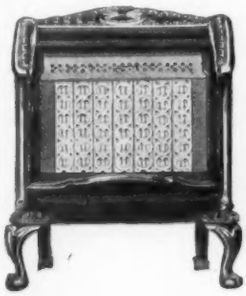
The high quality of the materials used, the splendid workmanship, the instantaneous, convenient, self-lighting service make Welsbach Heaters the final word in auxiliary heating perfection.

Serve Your Interests by Giving Your Customers the Best

Your customers look to you to tell them what is best. Serve your interests and theirs by giving them Welsbach Service.

Make next season the biggest heater year you ever had by planning now to get your share of Welsbach Gas Heater business.



No. 31

Our new seven-glower model. A heater chock full of energy and life. Compact size and light weight make it a heater of all-round usefulness, an ideal type for small room heating and emergency use.

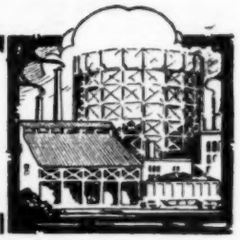
WELSBACH COMPANY
Gloucester, N. J.

Member American Gas Association

LIGHTING FIXTURES
GAS MANTLES GAS HEATERS

Welsbach PRODUCTS

With The Equipment & Appliance Manufacturers



Conducted by Business Department of American Gas Journal

NEW GAS HEATER PAMPHLET

The Roberts & Mander Stove Co., Philadelphia, Pa., which has been known for years as the manufacturers of "Quality" gas ranges, has just issued a 12-page pamphlet, illustrating and describing their line of "Quality" Radiant Gas Heaters. The construction of the heaters is shown by sectional views, as well as separate cuts of their burners. Types of both portable and fire place heaters are shown. Pamphlet will be sent on request.

NEW "TRUCKRANE" BULLETIN

The Byers Machine Co., Ravenna, Ohio, recently issued a 16-page bulletin describing the Byers Truckrane, which is a small industrial crane designed to be mounted permanently on a motor truck chassis. In their description they say:

"Any 5-ton or larger truck having a minimum length of 9 feet 6 inches from rear of driver's seat to center of rear axle, can be readily adapted to the purpose.

"A second-hand truck, if in good running condition, will answer fully as well as a new one.

"Power is furnished by a high-grade 35 H. P. gasoline motor built into the Truckrane—entirely separate from the power unit of the motor truck.

"The Truckrane provides the capacity, operating speed, and labor-saving mechanical features of a rugged, sturdy industrial crane, plus the movability and traveling speed of the motor truck on which it is mounted, and is offered as a fully-developed and thoroughly practical working unit. Its development stage is past—we did all the experimenting before we filled our first order."

CONSULTING COMBUSTION ENGINEERS

Jos. W. Hays is just completing the organization of a corps of consulting combustion engineers to be known as Jos W. Hays and Associates. The headquarters of the organization will be Michigan City, Indiana.

Mr. Hays has been finding it impossible for some time past to meet all of the demands upon his time, and for this reason is forming the organization.

Jos. W. Hays and Associates will be prepared to render consulting service in steam plants in all parts of the country. Every man in the organization will be a combustion expert of wide practical experience. No change will be made in the place of residence of any of these Associates. Each member of the organization will look after the engineering work in his immediate territory.

All communications should be addressed to Jos. W. Hays and Associates, Michigan City, Indiana.

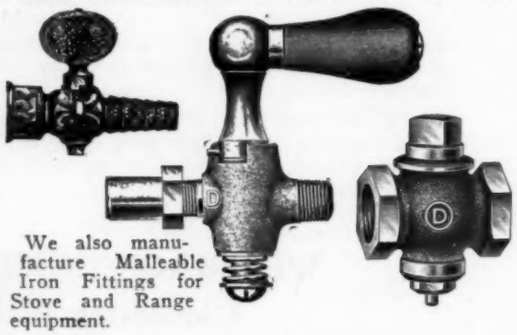
CONNECTICUT BLOWER CORP.

The Connecticut Blower Corporation, Hartford, Conn., has been incorporated under the laws of Delaware with capital of $250,000, with M. E. Keeney, president; C. H. Keeney, treasurer; C. E. Keeney, secretary. They have taken over the International Blower Company and the Hartford Sheet Metal Works. The products manufactured and installed are of a large variety, such as blowers and exhaust fans, blower systems of all kinds, dust collecting systems, exhaust systems, ventilating systems, etc. The plant of the International Blower Company will be utilized until fall at which time a considerably larger plant will be occupied.

The Dependable Line

We make Gas Cocks of every description to conform with the A. G. A. and U. G. I. specifications, and to fit any manufacturer's particular requirements.

We make a full line of Gas Hose Cocks and Gas Service Cocks—all sizes and styles. Gas Mixers—Hose Nipples and Mixer Pins. Brass Valves of all kinds.



We also manufacture Malleable Iron Fittings for Stove and Range equipment.

Detroit Brass & Malleable Works
(formerly Detroit Valve & Fittings and Detroit Brass Works)
Holden & Greenwood Avenues, DETROIT, MICH.
New York Office (Metropolitan District Only): 66 Cliff Street
H. Romeyn Smith, Eastern Sales Manager
C. M. Crookshank (Southern Representative, Texas and Oklahoma): 915 Great Southern Life Building, Dallas, Tex.

users of gas, and to produce gas-burning appliances best adapted to serve those needs. A great number of such appliances were produced. Experience was accumulated in hundreds of industries.

Business-Getting Results

AN example of the results gained by this work is furnished in the case of Henry L. Doherty & Company's plant at Toledo, Ohio, a plant which probably furnishes more gas to industrial users than any other gas company in the United States. Mr. Floyd Parsons, writing in the "*Gas Age-Record*" for November 4th, 1922, says,—"There isn't a doubt in the world that within the next four or five years we will witness such advances of gas into the industrial field that instead of this load being 10 or 20 per cent of the total, it will be from 50 to 80 per cent."

We Are Organized to Help You

MR. Parsons' prediction can be made true only by making it possible for every gas company in the country to furnish prospective customers in the industrial field with gas-burning appliances correctly designed and constructed to produce better results than those customers can obtain with any other fuel. We are organized to render exactly that sort of service. All the experience of the old Improved Appliance Company, now the Furnace and Appliance Division of this corporation is at your command.

We Will Show You How to Get the Business

THE methods we have found successful in converting industrial concerns to the use of gas in place of other fuels, for the benefit of Henry L. Doherty & Company gas companies, are available to your company. Remember that we are in the gas appliance business from the gas man's standpoint. We know the gas man's problems because we are gas men ourselves.

We Will Supply the Experience—the Engineering—the Appliances

A GREAT number of the appliances we have developed are now standard equipment in their respective industrial fields. Quick and profitable results can be obtained toward the increased sale of gas by your company by checking these appliances against the requirements of industrial plants in your vicinity. Where special conditions are encountered our engineers will be glad to aid you in arranging a suitable adaptation of any of our appliances to meet the conditions.

We Develop New Appliances for Your Customers

OCCASIONALLY you will find a case where it is necessary to design an entirely new appliance. We have done this many times in the past—often at a cost to ourselves greatly in excess of the price paid us by the consumer. We have been willing to accept such losses, regarding them as investments in the future of our business and in that of the industry at large. Therefore we are equally ready to undertake the development of new appliances for your prospective industrial customers whenever in our judgment the expense involved will be warranted by ultimate gas and equipment sales.

Write for Data

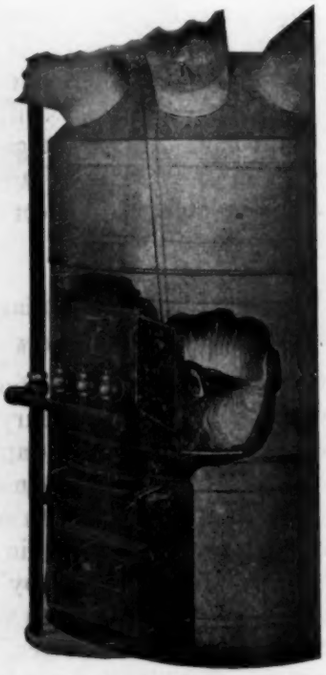
WE WILL gladly furnish interested gas men with complete information definitely presenting our service. Write for the data.

COMBUSTION UTILITIES CORPORATION

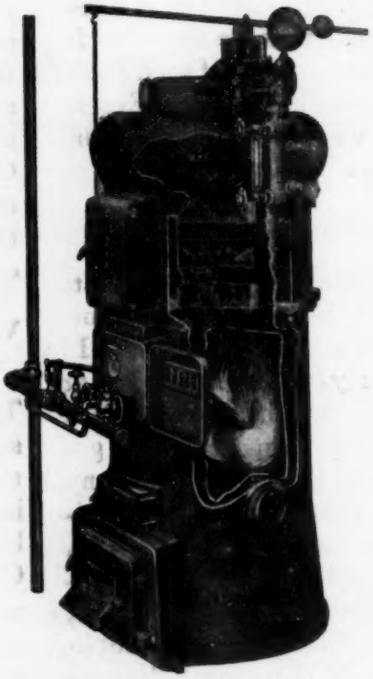
8-10 Bridge Street, New York

THE FRANKLIN

Quick Removable Gas Burner System



Showing Installation in Warm Air Furnace.



Showing Installation in Hot Water Boiler.

Mr. GAS MAN,
Atlantic City Convention.

Gentlemen:—

High priced coal is here to stay and your customers are depending on you to show them how they can use gas in their present heating plants and eliminate the dirt and drudgery of firing with coal.

The New Improved Franklin Quick Removable Gas Burner System is doing the trick for thousands of satisfied users every day and the wide awake gas company is making a nice profit selling them.

The Franklin Burner is not a makeshift or a piece of pipe with a flare at one end and a mixer at the other. The Burner is scientifically designed from measurements and calculations of Venturi Tubes approved by The United Sates Bureau of Standards and the combustion therefore obtained means for economy and high efficiency.

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Yours very truly,

FRANKLIN GAS BURNER MFG. CO.
Vine and Mitchell Avenue
CINCINNATI, OHIO

MEMBERS
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OVER 100,000 NOW IN USE.

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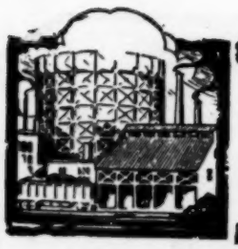
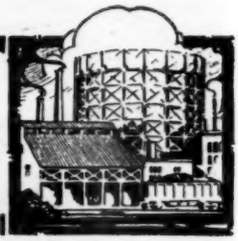


With The Equipment & Appliance Manufacturers



Sprague Service Regulators

The Sprague Meter Co., Bridgeport, Conn., recently issued Bulletin No. 9, in which is described their new service regulators.

The improvement as illustrated permits the removal of the top casting for the renewal of diaphragms without taking down the service pipe. The tail pieces are furnished tapped for three-quarter inch, one inch and one and one-quarter inch pipe thread. Where desired, extra tail pieces can be carried in stock, so that one size outlet can be changed to the other sizes with ease.

The above features, together with the removable valve cap through the heel outlet, permits the renewal in place of the two perishable parts of the regulator—namely, the leather diaphragm and the valve cover leather.

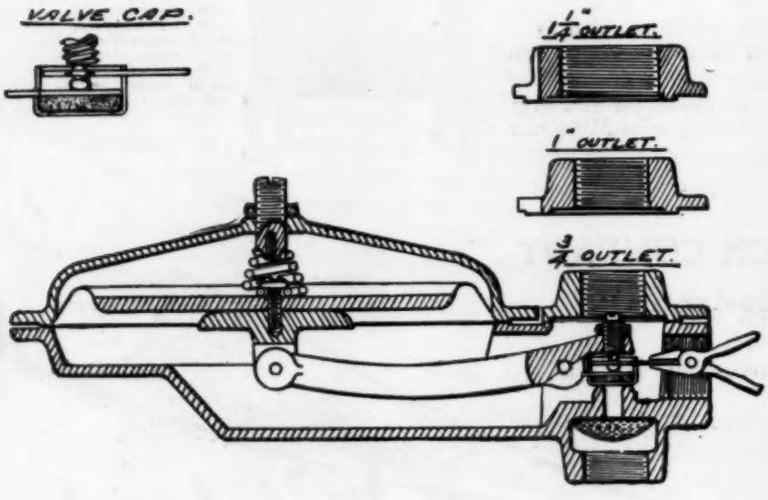
These regulators are furnished without the seal for medium pressures and with interchangeable mercury or oil seal for high pressures.

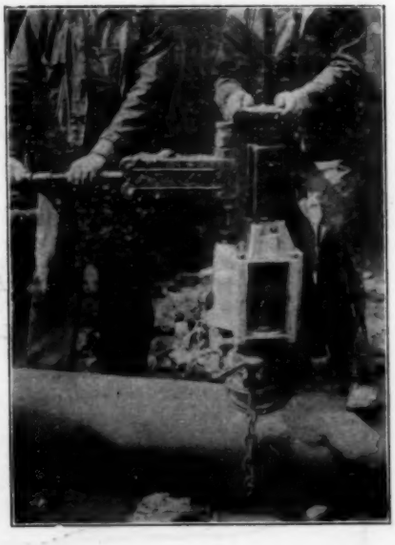
Power Pipe Tapping Machine

The Silent-Hoist Co., Brooklyn, N. Y., has placed on the market a power pipe tapping machine. The illustration shows the machine in operation. A superintendent of a gas company, after trying out the machine, stated: "From our experience it is not unusual to spend four or five hours with four or five men pulling on the ratchet handles to tap a four-inch or even a three-inch hole in a cast iron main. For those using the old hand method of cutting a hole with a diamond point in the pipe and then reaming and threading the hole by hand, and all during the operation the men are under gas, if the main is alive, this power machine should prove to be a great benefit, not only in cutting the expense in half, but in saving the man power, which is becoming daily a greater item to be considered, especially in the gas business.

"It has been proven and accomplished time and again that with the power tapping machine a three-inch hole can be drilled, reamed and tapped ready for the plug in ten minutes, for a four-inch hole fifteen to eighteen minutes. At the same time the labor is performed by a machine, the man power is saved for other work, and the men, if a live gas main is tapped, are not played out from receiving too much gas, as with the hand tapping machine.

"The machine is not purely a power machine, but can be used by applying a hand rachet to the drive shaft. Instead of having a direct application of the ratchet to the tap, as in the hand machine now generally used, the power applied is increased greatly by the gear reduction, making it considerably easier for a man to tap by hand."





The Problem of Making It Pay the User

GRANTING that gas men generally realize that the future of the gas business is in the industrial heating field, these same gas men are nevertheless confronted with the necessity of proving the proposition that it will pay the prospective user to scrap his present equipment and install a gas-burning appliance. You have got to prove to your prospect that he can "do it with gas"—and that it will pay.

The Right Answer Is the Right Appliance

THE RIGHT appliance is the key to the situation. We discovered that more than twenty years ago. For more than two decades we have been helping Henry L. Doherty & Company properties sell more gas. Selling the gas to the industrial user was easy—when we could show him a gas-burning appliance that would earn him a profit. Henry L. Doherty & Company gas properties sold the gas. And it was our job to produce the appliances that enabled them to sell more gas.

That Is Where We Help You

WE ARE gas men. We know what you are up against. We have been "through the mill". We have developed an organization, gained experience, produced appliances—all of which have proven their value as business-getters in selling gas to the industrial field. This organization, with its experience and appliances is available to your company—ready to help you sell your gas to your potential industrial customers.

We Have Designed and Built Thousands of Gas-Burning Appliances for Industrial Service

WE HAVE designed thousands of gas-burning appliances for industrial service. Many of these are standardized—ready for immediate shipment to your customers. In the majority of cases we will be able to supply equipment of standard type that will meet every requirement. Occasionally, however, you may encounter a prospect whose needs cannot be met by existing appliances. Yet the situation is such that the possibilities offered for large gas consumption are very attractive, and a suitable appliance designed to fit the case would find equally profitable application elsewhere.

Special Appliances

IN SUCH cases we are often willing to study the requirements and conditions, and design, build and install a special appliance. As a rule such appliances cost us many times the sum we receive for our service. But we are looking ahead and we believe that in the long run it will pay us to do this.

Start Your Drive—We Will Co-operate

START your drive for industrial load now. We will cooperate by showing you how we have attained results in similar drives conducted by our associated gas companies. We will support you with engineering service, and supply the appliances your prospects will require. As a first move, write us for

How to sell Gas For Industrial Heating

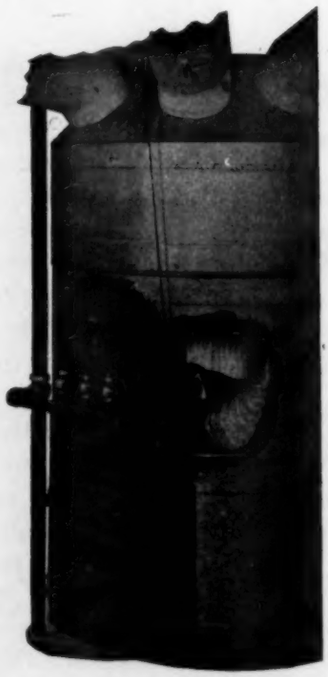
COMBUSTION UTILITIES CORPORATION

8-10 Bridge Street, New York

29-0130-5

THE FRANKLIN

Quick Removable Gas Burner System



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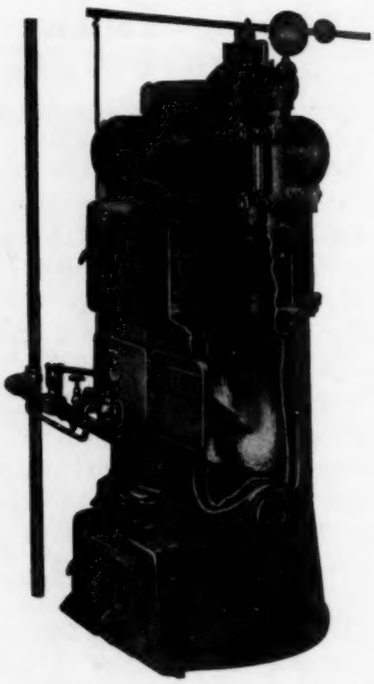

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OVER 100,000 NOW IN USE.

Declares Dividend

The directors of Public Service Corporation of New Jersey at their regular meeting in Newark today (Tuesday) declared a quarterly dividend of $2 per share on the 8 per cent cumulative preferred stock; a quarterly dividend of $1.75 per share on the 7 per cent cumulative preferred stocks, and a quarterly dividend of $1 per share on the non par value common stock.

Dividends will be paid on December 31 to stockholders of record December 14.

To Mix Artificial and Natural Gas

Louisville, Ky.—A measure authorizing the mixing of artificial and natural gas by the Louisville Gas and Electric Co. was unanimously passed by the General Council.

The bill had the approval of the Board of Public Works, Mayor Huston Quin and the Public Utilities Bureau. Approval was given at a conference between Judge Arthur Peter, the company's counsel; Donald McDonald, vice-president and general manager of the company; T. B. Wilson, vice-president, and Mayor Huston Quin.

The scale of rates asked by the company from January 1 to March 1, 1924, compared with those of 1923, are as follows: First 5,000 feet, no change in price; from 5,000 to 10,000 feet, 5 cents increase a thousand cubic feet; from 10,000 to 20,000 feet, 10 cents increase a thousand cubic feet; more than 20,000 feet, 25 cents increase for each thousand cubic feet.

According to estimates there will be approximately 38,000,000 cubic feet available for Louisville daily in any emergency that might arise. The company is able to obtain about 20,000,000 cubic feet of natural gas each day, and the new $2,000,000 Beargrass plant will be able to furnish 12,000,000 cubic feet a day. The two gas manufacturing plants, which are still in operation, will be able to furnish 6,000,000 cubic feet a day.

Practically all construction on the Beargrass plant is completed, according to M. W. Walsh, superintendent of distribution. Should any severe cold weather cause lowered pressure either before or after the time called for in the proposed ordinance, the company will supply the needed artificial gas to make up any deficiency.

The franchise rates on gas are as follows:

More than 700 and less than 1,100 cubic feet per month, 72 cents; more than 1,100 and less than 1,300 cubic feet, 83 cents; more than 1,300 and less than 1,500 cubic feet, 94 cents; more than 1,500 and less than 1,600 cubic feet, $1.02; more than 1,600 and less than 1,700 cubic feet, $1.08; more than 1,700 and less than 1,800 cubic feet, $1.16; more than 1,800 and less than 1,900 cubic feet, $1.21; more than 1,900 and less than 2,000 cubic feet, $1.33; first 2,000 over 2,000, $1.33; all additional gas over 2,000 cubic feet at the rate of 38.88 cents per 100 cubic feet.

Mixed Gas Used Successfully in California

Santa Barbara, Cal.—The Southern Counties Gas Company of California has turned mixed gas of 700 British thermal units into the local distribution system, replacing the former artificial gas of 500 heat units. The change from artificial to mixed gas was made on November 15 and very little inconvenience was noted among the gas consuming public as a result of the increased heat content of the new fuel.

In order to switch from artificial to mixed gas here the Southern Counties Gas Company laid a 30-mile natural gas transmission power main from the Ventura River Fields, located near Ventura, Ventura County, to this city. The line extends from the company's Ventura compressor plant along the State highway to this city. The main parallels the boulevard along the ocean and follows the causeways over the surf near Point Rincon.

Actual construction on this improvement began about July 15 and completion was made on November 14. Many engineering difficulties were overcome in putting in this line, chief of which were the problems in paralleling the causeways. The construction work was handled by the Taylor-Forgie Company of Los Angeles, which established a construction camp at Point Rincon, the halfway point between Ventura and Santa Barbara. Two crews of men worked from Rincon one going north and the other south.

The cost of this improvement approximated $300,000, which sum is for the 158,000 feet of main, the cost of installing the line, together with added compressor units at Ventura and some machinery and equipment at the Santa Barbara plant.

The natural gas upon its arrival at the Santa Barbara plant is broken down and goes into the local distribution mains with 700 B. T. U. heating value. A portion of the gas is reduced to 600 B. T. U.'s and is then mixed with the 1,100 heat value gas, the final product being the 700 heat unit gas.

While the company had anticipated some adjustment difficulties as a result of increasing the heat content of the gas, actually very little difficulty was noted. A corps of expert appliance adjusters was held in readiness at the Santa Barbara office to answer calls from consumers, the first day's report showing only two calls. In view of the fact that some of the appliances may later develop adjustment difficulty, the company is now making a house-to-house canvass of the city, adjusting all appliances in the district.

The Santa Barbara district comprises Santa Barbara proper and Montecito. The new natural gas transmission power main passes through the community of Carpinteria, where the company has laid out a distribution system. Natural gas was turned into the Carpinteria distribution mains on November 10, a few days prior to the time the mixed product entered the Santa Barbara mains. Approximately 125 consumers were added to the company's growing army of patrons as a result of the new Carpinteria territory. In addition to the new domestic consumers, a number of industrial users are now being supplied with natural gas.

C. E. Rutledge, district superintendent in charge of the Southern Counties Gas Company Santa Barbara properties, is satisfied with the results shown by the new fuel. Rutledge is the newly appointed manager of the company's northern district, succeeding Frank H. Bivens, now in charge of the Southern Counties Gas Company's Long Beach district.

Xenia Decides to Pay "Service Charge" for Gas

Xenia, O.—The gas ordinance giving the Ohio Fuel Gas Company the right to make a "service charge" of 50 cents to each consumer in Xenia, was taken from the table, where it was placed several months ago, and passed by the City Commission.

The ordinance is for a period of one year. The gas rate fixed in it is the same as that existing now, 50 cents a thousand cubic feet, with 5 per cent discount, and the only additional feature is the service charge, which will make the first 1,000 feet cost $1 instead of 50 cents.

The Ohio Fuel Gas Company placed its plan to secure the extra charge in Xenia before the City Commission last spring, when J. F. Curry, a field representative, presented the ordinance, which was finally adopted. The Commission held up final action in the matter in the hope that something might be done to secure the old rate, but the attitude of the utilities commission, and the fact that virtually every municipality in which the gas company had presented its demands for the increased charge has adopted an ordinance allowing it, caused the commissioners to decide that the best interests of the city would be conserved by the adoption of the plan. The ordinance will become effective in 30 days.

Prohibit Use of Water by Manufacturer Outside City

Buffalo, N. Y. — Corporation Counsel Rann of Buffalo has issued a ruling that it will be illegal for Buffalo to sell water to the Iroquois Gas Company for use in the new plant which it has under construction on Mineral Spring road, just outside the city limits.

The Iroquois Gas Company applied for permission to buy water from the city of Buffalo because of the fact that the gas plant under construction is to be used to serve Buffalo. But the corporation counsel ruled that water could not be sold outside the city limits for any purpose. It was brought out that under an old arrangement a number of plants outside the city had been served with city water and some of them are still being served.

Company to Build Holder

Wilmington, Del. — The Wilmington Gas Company has taken out a permit from Building Inspector Ellis P. Preston's office for the erection of a new gas holder, at the foot of Madison street, to cost $223,000. The work will be done by the Bartlett Hayward Co., of Baltimore, Md.

The tank will be 144 feet in diameter and 177 feet and 4 inches high. It will hold 2,000,000 cubic feet of gas.

Purification Apparatus Installed

The Diamond Alkali Company of Painesville, Ohio, which is building a new coke plant to provide materials for its own products, will sell surplus gas to the gas companies in Ashtabula and Painesville and probably to other nearby cities.

Contract has been placed with the Gas Machinery Company of Cleveland, Ohio, for three duplex steel purifiers each 20 feet diameter by 12 feet high, complete with gate valves and connections, trays and tray beams and auxiliary equipment.

Provision is also made for future installation of purification apparatus so that the present as well as future demands for gas in this territory can be properly taken care of.

New Equipment for Laconia, Wash., Gas Plant

The Byllesby Engineering and Management Corporation of Chicago has awarded a contract for the Tacoma Gas and Fuel Co., Tacoma, Wash., covering two ten-foot carburetted water gas sets to the Gas Machinery Company of Cleveland, Ohio.

The equipment is to be delivered and erected, and includes generators, carburetters, superheaters and stacks, seal-separators and auxiliary equipment.

The gas company is installing one electrically driven blower and one steam driven blower to supply proper blast to the above apparatus and the Gas Machinery Company is installing its standard 24-inch explosion check valves in the new blast piping.

Gas Company to Build Million Dollar Plant

Harrisburg, Pa.—L. S. Williams, general manager of the Harrisburg Gas Co., announced the purchase of thirteen acres of ground from the Cameron estate in Steelton. Title was taken by George R. Hemminger for the gas company.

The tract is located near the plant of the Harrisburg Light and Power Company and bounded by the Pennsylvania Railroad tracks and Franklin street. The consideration was $130,000.

A gas handlings plant will be constructed, including a purification plant, which will have a capacity of approximately 400,000 cubic feet of gas per hour, while two electric driven pushers will take care of 300,000 cubic feet of gas per hour. The purpose of this plant is to receive, purify, store and distribute gas from the coke oven direct to the consumer.

The boiler plant, consisting of two 125-horsepower return tubular boilers, will be equipped with McCleave grates for burning river coal, and will be used in cold weather for heating the gas holders. It is proposed to build two gas holders storing a very large quantity of gas.

Mr. Williams recently announced certain improvements to the present manufacturing plant, totalling an expenditure of $175,000, and the developments of the acquired plot of ground will mean an additional expenditure of $500,000 during the coming year.

When completed, improvements will have cost over $1,000,000, and will be the last word in modern gas work construction.

Three New Styles of Welsbach Heaters

Leaders for Next Season's Business

The influence of Welsbach advertising plus dealer enthusiasm have resulted this year in an unprecedented sale of Welsbach Heaters. For next season three new styles will be ready to increase Welsbach Gas Heater popularity.

The Nos. 29 and 27, equipped with andirons, and the new No. 31 have been designed to enable you to offer Welsbach efficiency, economy and convenience in every required size and style of heater. The complete Welsbach line will enable you best to put across to your customers the Welsbach message of "comfort plus economy."

The No. 29 fireplace model, equipped with andirons. Finished in either oxidized brass or oxidized copper, its beautifully balanced, sturdy appearance will make this heater sell itself.

Here is the capable, business-like No. 27 equipped with andirons. It has grace and refinement—a handsome, appropriate model for any fireplace. Oxidized brass or oxidized copper finish gives color to its appearance.

Backed by our Vast Knowledge and Experience

it is only natural that Welsbach Heaters should contain every feature that helps toward maximum heat production and greatest economy. To the special burner and glowers is due the unsurpassed volume of heat. A copper reflector prevents waste and sends all this warmth out into the room.

The high quality of the materials used, the splendid workmanship, the instantaneous, convenient, self-lighting service make Welsbach Heaters the final word in auxiliary heating perfection.

Serve Your Interests by Giving Your Customers the Best

Your customers look to you to tell them what is best. Serve your interests and theirs by giving them Welsbach Service.

Make next season the biggest heater year you ever had by planning now to get your share of Welsbach Gas Heater business.

No. 31

Our new seven-glower model. A heater chock full of energy and life. Compact size and light weight make it a heater of all-round usefulness, an ideal type for small room heating and emergency use.

WELSBACH COMPANY
Gloucester, N. J.

Member American Gas Association

LIGHTING FIXTURES
GAS MANTLES GAS HEATERS

Welsbach **PRODUCTS**

Society of Gas Lighting Elects Officers

The 47th annual meeting of the Society of Gas Lighting was held at the Hotel Astor Thursday, December 13, 1923, and the following were elected as officers for the ensuing year: President, Charles H. Nettleton; vice-president, Wm. Cullen Morris; treasurer, Wm. J Welsh; secretary, Geo. G. Ramsdell; member of executive committee, Alex. H. Strecker; finance committee, E. C. Uhlig, F. C. Freeman, R. A. Carter, Jr.

Providence Gas Company Offers Stock to Patrons

Providence, R. I.—A limited number of capital shares of stock of the Providence Gas Co., acquired in the open market, are offered patrons by company officers.

Charles H. Manchester, president of the company, commenting on the offer, said:

"We have again acquired a limited number of shares of our capital stock which we are offering to our customers at exact cost to us, $65 per share, payable in cash or in equal quarterly instalments.

"It has been our experience in similar offerings in the past that all the available stock has been taken in a very few days and that many applications have been received after the available stock was exhausted.

"The number of shares we have been able to buy for the present offering is much smaller than on previous similar occasions and I am therefore advising those of our customers who wish to take advantage of this opportunity to do so promptly, in order to avoid disappointment. Applications for stock will be accepted strictly in the order received until the supply is exhausted.

"We believe this stock to be an excellent investment for our customers. It is free from local taxation and from the normal Federal income tax and the rate of dividend is 8 per cent, or $4 per share per year.

"The business of the company is steadily increasing and we are confident that it will continued to do so. Circulars announcing this opportunity to buy stock were mailed to our 72,000 customers."

Easton Gas Works Has Large New Gas Holder

Easton, Pa.—Increased storage capacity that will enable the present gas manufacturing equipment to operate at greater efficiency is being provided by the Easton Gas Works in the erection of a huge gas holder that will have a capacity of 1,000,000 cubic feet. The big tank, concrete foundations for which are already in place, is being built on property owned by the company in the western part of the city by the Cruse-Kemper Construction Co. of Ambler, Penn. It will cost $150,000 and will be completed, according to the terms of the contract, by May 15, 1924. Work was started on the concrete foundations last October.

The present storage capacity of the Easton Gas Works is limited, the only holder being one of 500,000 cubic feet capacity. The new holder, almost two miles distant from the plant where the gas is manufactured, will be twice as large as the one now in service. It will enable the gas works to give better service to its customers by having an ample supply of gas available at times when the demand is greatest.

The new gas holder will have three lifts, or sections. The tank will be 126 feet in diameter and 91 feet in height when completely filled with gas.

Gas from the new holder will be distributed principally to the consumers in South Easton, Wilson Borough and in that section of Easton west of Seventh street. Every gas consumer will be benefited by the improvement whether or not they reside in the territory that will be served direct from the new holder because of the reduction in the demand upon the old holder on Front street.

Construct Gas Plant for City of Kinston

Kinston, N. C.—Construction of the gas plant to be installed here by the Washington Gas Co. will be started early in the next year, possibly in January, it was announced following a conference between Mayor Wayne Mitchell and a representative of Pennsylvania capital backing the company. Final reading of the franchise, which has been through two readings and transferral of property by the municipality to the company are the only remaining necessary preliminaries.

The company is expected to expend considerably more than $100,000 for the plant. The same concern, it is reported here, will install a plant at Greenville. Pipes may be laid into dwellings constructed from now on, the Mayor announced.

Tarrant City to Get $100,000 Gas Plant

Birmingham, Ala.—Tarrant City in granting a franchise for a gas purification plant and gas service of the city, will, within a short time be as fully equipped in the matter of domestic conveniences as any of the cities in the state, the gas to provided from the Alabama By-Products Corporation at that place. Enriching, as well as purification, is proposed, and a fine supply of domestic gas is assured. Inglenook is expected to take the same action as Tarrant City and other places in that section, so that a system will be established that will assure the people plenty of domestic gas. The plant to be erected will cost around $100,000.

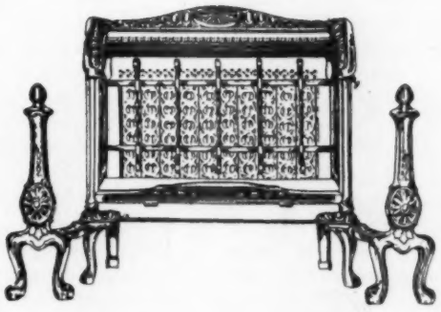
Arthur H. Hall Elected Vice-President of Cambridge Gas Co.

Cambridge, Mass.—The directors of the Cambridge Gas Light Co. have elected Arthur H. Hall as vice-president of the company to fill the vacancy caused by the death of Earl B. Barnes. Mr. Hall is a native of New York City and is a graduate of Stevens Institute. For the past twenty years he has been connected with the New York Consolidated Gas Co. as superintendent of distribution and assistant treasurer of the Central Union Gas Co., one of the subsidiary companies of the New York Consolidated, and comes to Cambridge very highly recommended.

To Reduce Rates

Gadsden, Ala.—The Tri-Cities Gas Co. will make another reduction in rates, the new schedule to become effective about January 1, Manager J. S. Rider has announced.

These Features of Welsbach Heaters Mean Big Sales for You



No. 27 with andirons. Furnished in either oxidized Brass or Black and Verde.

Equipped with ten glowers and self lighter. Can also be furnished without andirons.

Welsbach Gas Heaters have numerous points of superiority which are distinctive to Welsbach design —features which are so valuable that they are producing sales wherever Welsbach Heaters are shown.

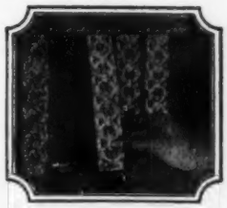
The questions people used to ask about gas heaters—"Are they economical?"—"Are they odorless?" are answered once and for all in the efficient performance of these super heaters.

In the design of Welsbach Heaters you will find the very things which discriminating buyers insist upon having in the heaters they buy. Maximum heat production, resulting from an exceptionally efficient burner. Full radiation of heat—produced by metal reflector. Absolute convenience found in eliminating the need for matches and using a pyrophoric self lighter instead. Proper combustion insured by screening the air used, thus keeping all dust and dirt from the burner caps.

The Welsbach line offers a wide choice of attractive models for both portable or fireplace use, in styles and finishes to meet every taste. It is the most practical means of extending the use of gas as an auxiliary heating service among your consumers. Make use of it to increase your sales.

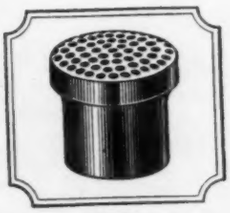
Self Lighter

This is an exclusive Welsbach feature which starts a flame without using matches. A fat hot spark is flashed into the header, lighting the gas evenly and smoothly.



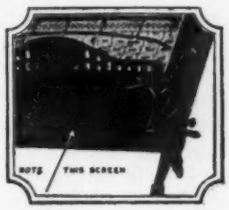
Glowers Kept from Breaking

Note the way Welsbach glowers are set in place. They can't fall out and break, although each glower can easily be removed.



Burner Tips That Don't Clog

Welsbach burner tips have a fireclay top—not one of metal which rusts, corrodes and clogs. Tips are designed for both natural and artificial gas. The illustration shown above is for artificial



Protection from Dust

The wire screen shown over the air intake is another exclusive Welsbach feature. It prevents dust from clogging the burner orifices and insures proper combustion and maximum heating power.

WELSBACH COMPANY

Gloucester New Jersey

Member American Gas Association

Welsbach GAS HEATERS

New Owners Take Over Property

New owners of the Alpena gas plant are now in possession of the property, the officers of the newly incorporated Alpena Gas Co. having taken over the property on behalf of the Gas Engineering Service Co. of Grand Rapids, which has been revealed as the parent organization.

Leland N. Young of Grand Rapids, representing the Charles F. Young estate, previous owners of the property, and Fred W. Seymour of Battle Creek, president of the Gas Engineering Service, arived in Alpena to consummate the transfer to the new owners. The old Alpena Gas Co. being the property of the Young estate, and consequently not being incorporated, necessitated the incorporation of the new company and its appearance at Lansing for incorporation.

The Service Company is in reality a holding company and owns three other plants in the State, all acquired this year, the company having been organized by Battle Creek men in April of this year. The properties are Marshall Gas Light Co. of Marshall, the Owosso Gas Light Co. of Owosso, and the Gratiot County Gas Co. of Alma. this latter plant serving by means of high pressure lines the towns of Alma, Ithaca, St. Johns and Breckenridge, all in Gratiot county.

The executives of the Service Co. are also the executives of the Battle Creek Gas Co. of Battle Creek. Mr. D. H. Frazer is president and treasurer of the latter company and vice-president of the Gas Engineering Service Co., and Fred W. Seymour is president of the Service Co. and vice-president and general manager of the Battle Creek Gas Co.

The new owners have appointed C. L. C. Kah, formerly assistant gas engineer of the American Public Utilities of Grand Rapids, to the position of local manager at Alpena. Mr. Kah is a man of considerable experience in the gas business, as well as being a graduate from the engineering department of the University of Michigan, and will be vested with full authority by the new owners in dealing with the company's affairs in Alpena.

In outlining the policies of the new owners, Mr. Seymour said:

"We believe that our organization will bring to the Alpena Gas Co. certain advantages which will revert to the benefit of the company and Alpena. The company's affiliation with a group of properties will bring to it greatly increased purchasing power which should result in more economical purchase of materials and supplies and also better selling position of its by-products. The same can be said concerning men available for operation. We also stand ready to put additional capital into the local subsidiary and to expand its usefulness to a point in keeping with your prosperous and growing community, whenever extensions can be profitably made and not be a burden to the present consumers. Such a program of expansion and extension will likely run into a large sum of money. We hope to demonstrate that Alpena will receive the best of service and courteous treatment at all times, and at rates as low as are compatible with such service, and we request the consideration and helpful criticism of the community in bringing this to pass."

Dividend Announcement

H. M. Byllesby & Co. announces that the board of directors of the Standard Gas & Electric Co. has declared a quarterly dividend of 62½ cents a share on the common stock of the company, payable January 25, 1924, to stockholders of record December 31, 1923.

Gas Co. Gives Cooking Demonstration

Westboro, Mass.—The cooking school conducted in Grange Hall under the direction of the Westboro Gas & Electric Co. and the Westboro Woman's Club closed on December 14. According to officials of both the Woman's Club and the Gas Company, the school was a profound success. The teacher was Mrs. Sadie Bean.

Improving Lighting System

Clinton, Mass.—The street lighting committee of the Clinton Chamber of Commerce has determined its program relative to improving the lighting system in the business district. The committee will ask the Board of Selectmen to include in its budget for 1924 a request for an appropriation of $14,000 for street lights, an increase of $3,000 over recent years. This added amount will pay for the installation and maintenance for the next year of better lights in Mechanic, High and Water streets. A new schedule of costs furnished by R. F. Freel, superintendent of the Clinton Gas Light Co., shows the increase the first year per light to be from $25 to $55 and thereafter $75, the first year credit of $20 per light to be allowed for the existing lights. The new lights will have six times the power of the present lights.

Wants to Purchase Plant

Boston, Mass.—Marcy L. Sperry, vice-president of the Haverhill Gas Light Co., has asked the Public Utilities Commission to approve the purchase by the company of the Amesbury and Salisbury Gas Light Co. The company is to pay $109,500 for the property and seeks authority to issue $393,120 of new capital stock to provide funds for the purchase and for improvements to the plant, as well as extensions to its own plant. The Amesbury and Salisbury Company supplies Groveland, Merrimac, Amesbury and Salisbury. The matter has been taken under advisement.

Old Time Gas Man Dies

Augusta, Me.—William H. Williams, general manager of the Augusta branch of the Central Maine Power Co., died last week at his home on Main street, aged 73 years. In 1887 Mr. Williams was superintendent of the Augusta Water Works until the company was taken over by the Augusta Light & Heat Co. When that company was absorbed by the Central Maine Co., he became superintendent of the Augusta district. He was a Mason, served two terms in the House of Representatives and was a vestryman in St. Mark's Episcopal Church. He leaves a

wife and son, George S. Williams, general secretary of the Central Maine Power Co.

NEW YORK ENGINEERING COMPANY

Builders of

GAS PLANTS

Scrubbers, Condensers, Purifiers, Riveted and Welded Pipe and Specials

Heavy Plate Metal Work a Specialty

Office: 2 Rector St., New York
Works: Yonkers, N. Y.

Fred W. Freese & Co.

ENGINEERS

Financing—Building—Managing and Operating Gas, Electric and Water Properties

Refinancing and Rebuilding Existing Plants

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Rates, Counsel and Commercial

First National Bank Building
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STOKERS

Builders of Mechanical Stokers for 35 years
Sales and Service Offices in All Principal Cities
Address Nearest Office
Westinghouse Electric & Mfg. Co.
So. Philadelphia Works, Philadelphia, Pa.

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Specializing in Public Utilities Management, Operation, Construction, Plans, Reports, Valuation, Rates, Public Relations, Accounting, Purchasing. We finance public utility properties and projects.

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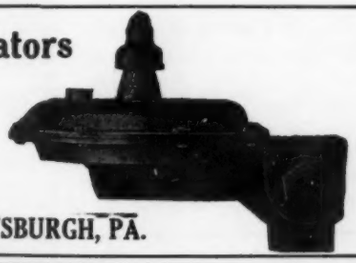
"EMCO" Meters and Regulators
For Artificial and Natural Gas

Meters for Low and High Pressure.
Proportional Meters, Provers, Gauges and Burners.
Regulators of all kinds.
Write for Catalog and Prices.

EQUITABLE METER CO. 432-34-36 First Avenue PITTSBURGH, PA.



IRON OXIDE

A prepared iron boring oxide whose physical properties make it purify at least cost.

Let us solve your purifying troubles

GAS PURIFYING MATERIALS CO., Foot of Halsey St., Long Island City, New York

Frank M. Travis
The Gas House Poet of Torrington
Breaks Loose Again

THE QUESTION

Old Friend Hooker, being human,
When you sit into a game,
And the limit of the rooftree
Seems to you a little tame,
With your "biler boost" behind you,
Tell us, Hooker, if you try,
Can you hist the bloomin' "ante"
To the limit of the sky?

THE ANSWER

Old Travis Friend of Torrington!
So here you are agin,
But I don't like your langwidge, boy,
It sounds too much like sin.
I think I see some poker chips
And hear the silver chink
And if it wasn't dry up there
I'd think I smell the drink!

And can I "hist your ante up?"
I don't know what you mean
But if she's Auntie Coalancoke
You bet I've the machine.
You "Hook'er to Biler", Son,
And in these Christmas days,
We fill your heart with comic songs
And tune your voice with praise.

For many years, good Travis Friend
(Gee whizz! How flies the time)
We two have sung each other's health
In good old Gas House rhyme.
You must be getting gray and fat
(I hope you wiser are)
Since you have "Hooked 'er" here below
Now "Hook'er to a star".

For after all is said and done,
This world with all its cares,
Is only a good training school
For better things "Up Stairs".
So in these Auto-mobile Days
Why shouldn't you and I
Just turn our faces Heavenward
And "HOOK'ER" UP ON HIGH!

"HOOK 'ER TO THE BILER"

Direct Acting

OVER 3000
IN DAILY USE

Double Geared

CRAIG RIDGWAY & SON CO., Coatesville, Pa.
ELEVATOR MAKERS TO FOLKS WHO KNOW

No. 29 Heating Machine

For continuous Hardening or Annealing; for Hardening Ball Bearings, Detachable Saw Teeth, or for Annealing Brass or any other work not exceeding 2½" greatest measurement.

We Make

Automatic Heat Controllers
Automatic Quenching Tanks
Blowers
Blowpipes or Blow-Torches, Hand and Stand
Boosters, Gas
Brass Melters
Brazing Furnaces and Tables
Burners
Burners for Electric Lamp Bulb Manufacture
Carbonizing Machines
Cyanide Furnaces
Cylindrical Furnaces
Forges
Forges, Glass Bending
Hardening Hammers
Heating Machines
Melting Furnaces
Muffle Furnaces
Oil tempering Furnaces
Oven Furnaces
Plating Furnaces
Rivet Heaters
Soft Metal and Lead Hardening Furnaces
Soldering Iron Heaters
Sweep Reducing Furnaces
Tempering Plates
Tire Heaters
Tube Heating Furnaces

Let us estimate on your Heat Treating problem. Write today.

American Gas Furnace Co.

Main Office and Works:
1000 Lafayette Street Elizabeth, N. J.

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW
VALVE MANUFACTURING COMPANY
TROY, N. Y.

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Boston Oliver Building
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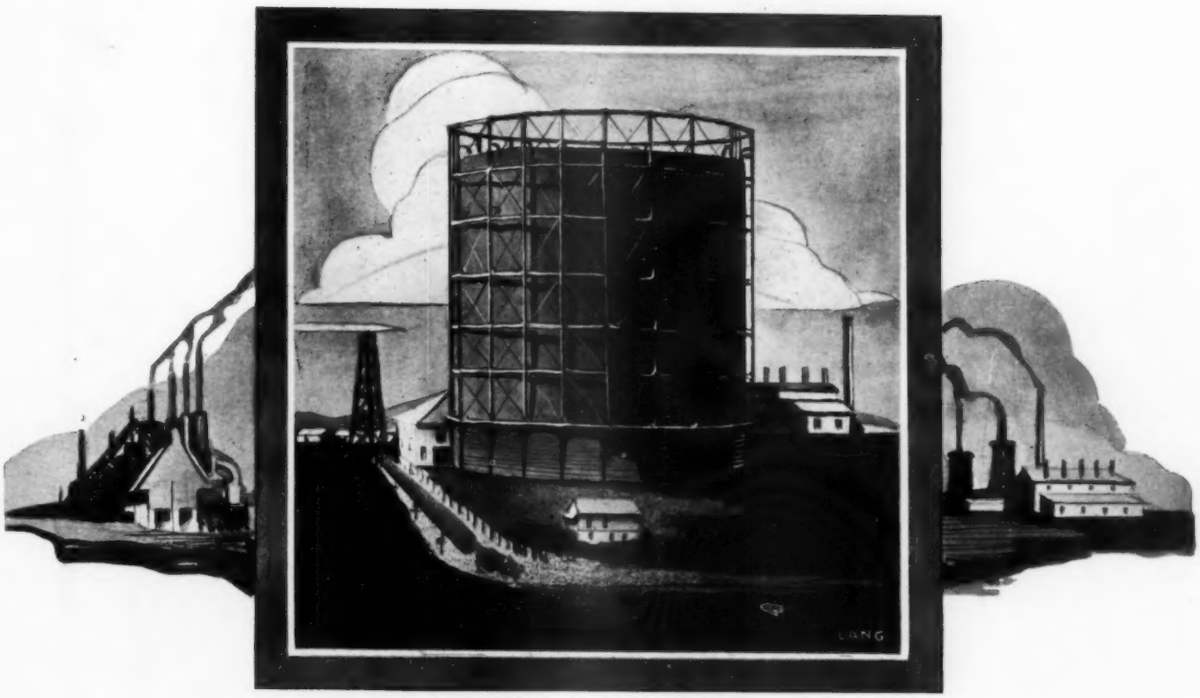
Pittsburg First Nat. Bank Building
Kansas City R. A. Long Bldg.



GAS HOLDERS AND TANKS

Washing, Condensing, and Purifying Apparatus

Valves - Bench Iron Work

General Line of Plate and Structural Steel Work

THE STACEY MANUFACTURING Co

J. FRANK STACEY, Pres. and Gen. Mgr. Edw. J. BAECHLE, Secy. and Treas.
THOS. C. RANSHAW, Vice-Pres. GEO. H. CRESSLER, Gen. Sales Mgr.

CINCINNATI, OHIO

The New Improved Open End Simplex Sells

OUR engineers developed the New Open End Model Simplex Ironer after much thought. Our Sales Department received it enthusiastically. The dealers did the same—but the one who thinks most of it is the housewife who uses the New Improved Simplex. She finds its usefulness enlarged to the point where she need no longer touch a hand iron. The Simplex irons everything—irons better and in quicker time. The new Simplex offers an opportunity for the Gas Company to make many profitable sales.

SIMPLEX IRONER
"THE BEST IRONER"

American Ironing Machine Co.

844 ADAMS STREET (West) CHICAGO

BRANCHES

70 W. 45th St.
New York City

180 New Montgomery St.
San Francisco

A Dollars and Sense View of Gas Making

Here is an installation of Plant "B", Detroit City Gas Co., that has proven profitable to its owners and admirably suits their particular requirements.

Coal is elevated by a Hunt Pivoted Bucket Conveyor and discharged through a chute into tank shown at the right, from which it is loaded into Hunt Industrial Cars and taken to storage bins.

THE increase in three items necessary to the production of manufactured gas during March, 1923, over the February, 1922, so-called high priced period according to the Missouri Committee on Public Utility Information, discloses the fact that prices are considerably higher than a year ago.

For example:—Steam Coal is dearer by 30 cents per ton; present coke prices $4.19 a ton higher, and gas coal $1.22 per ton in excess of the prices of a year ago.

This, of course, does not include handling and rehandling at your plant, for which you must add considerably more according to your method of conducting these operations. The muscle and wheelbarrow type is slow, time wasting and expensive;—for labor costs, too, have risen and the supply is scarce.

You may be using mechanical apparatus that has outgrown its usefulness and its frequent repairs entails an added burden instead of help. Or you may place your dependence on a conveyor when a skip hoist would effect greater economies, or vice versa. A steeple tower or an automatic railway would perhaps prove more advantageous in some cases.

So many factors can enter into the cost of handling and rehandling coal, coke and ashes in the gas plant, it behooves the executive to search deeply into this fundamental of gas making to prevent production costs soaring high above his profit on the sendout.

Hunt Cost-Cutting Equipment has been saving time, labor and money, in gas plants and other industries throughout this country and abroad for over half a century. Let Hunt Engineers, with their long experience and vast store of knowledge, look your plant over and plan an adequate handling system that will be a bulwark against the rising costs of production.

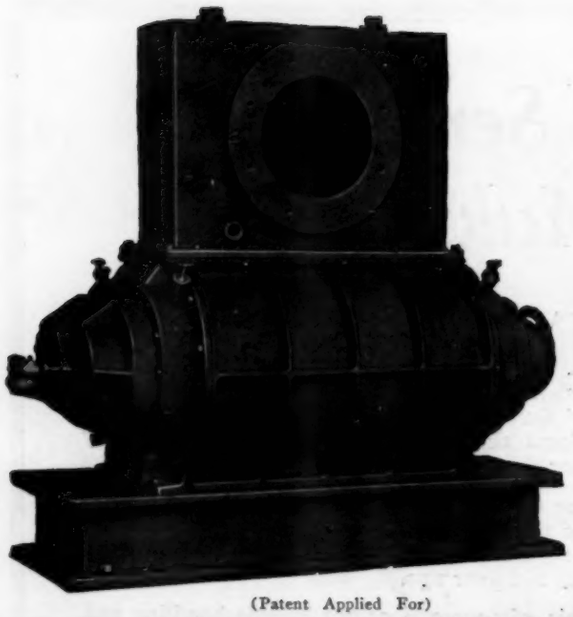
C. W. HUNT COMPANY, Inc.

West New Brighton, New York City

New York Office—Whitehall Building

PHILLIPS, LANG & CO., Inc.,
431 South Dearborn St., Chicago, Ill.

ERNEST F. LEARNED,
141 Milk St., Boston 9, Mass.



(Patent Applied For)

The Proof of the METER

A familiar adage says, "The Proof of the Pudding lies in the Eating." Modernizing it, let us say, "The Proof of the Meter Lies in the Using."

In this partial list of companies that have purchased and installed Connersville Rotary Displacement Meters will be found representative organizations from all sections of the country. Their experiences have justified the purchase.

Michigan Light Co.,
Jackson, Mich.
Wisconsin Gas & Elec. Co.,
Racine, Wisc.
Columbia Ry., Gas & Elec. Co.,
Columbia, So. Car.
Southern Indiana Gas & Elec. Co.,
Evansville, Ind.
Michigan Light Co.,
Kalamazoo, Mich.
Binghamton Gas Works,
Binghamton, N. Y.
Central Indiana Gas Co.
Marion, Ind.
Milwaukee Gas Light Co.,
Milwaukee, Wisc.
New York & Richmond Gas Co.
Staten Island, N. Y.
Coast Valleys Gas & Elec. Co.
Monterey, Cal.
Twin State Gas & Elec. Co.,
Brattleboro, Vt.
Worcester Gas Light Co.,
Worcester, Mass.
United Gas & Elec. Co.,
Augusta, Ga.
Madison Gas & Elec. Co.,
Madison, Wisc.
LaClede Gas Light Co.,
St. Louis, Mo.
Boonville Lt., Heat & Power Co.
Boonville, Mo.
San Antonio Public Service Co.,
San Antonio, Tex.
City of Holyoke,
Holyoke, Mass.
Michigan Light Co.,
Flint, Mich.
Connecticut Power Co.,
New London, Conn.

The Connersville Rotary Displacement Meter provides an accurate, dependable instrument of measuring the output of the plant or the consumption of a large industrial user. This accuracy does not depend on a number of delicate parts, but is assured by the sturdy construction of the Meter.

The Connersville Blower Co.

12th Street and Columbia Avenue
CONNERSVILLE, IND.

53 W. Jackson Blvd.,
CHICAGO

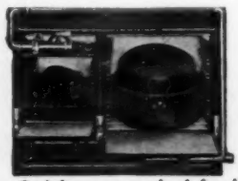
114 Liberty St.
NEW YORK

Connersville

One burner heats several vessels. Keeps a whole dinner hot. More heat utilized for cooking—fewer burners—less gas.

A bigger top that's hot all over. A smooth, level surface. The smallest vessels do not tip. Greater cooking satisfaction.

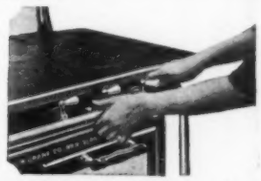
As easy to clean as a table top. Burners protected from grease, do not clog. Less effort. More leisure.



Quick, economical broiler. Splendid roasting and baking oven. No waste space. Rust-resisting finish inside and out.

A shelf 8″ deep that holds things. White enamel. Sanitary and practical. Roll top warming closet at small additional cost.

New comfort height takes backache out of cooking. It's no effort at all to cook on a SMOOTHTOP.



Automatic lighter. Just press the button and turn on the gas. Lights all the burners. Just another SMOOTHTOP advantage.

Saves kitchen space. More cooking capacity in less floor space than ordinary ranges. Makes room for other kitchen conveniences.

Eight Reasons Why Women Prefer

VULCAN SMOOTHTOP

COMPACT CABINET GAS RANGES

Nine out of ten women will buy a VULCAN SMOOTHTOP Gas Range in preference to any other if these features are even briefly described to them and everyone will become a booster after having cooked on one.

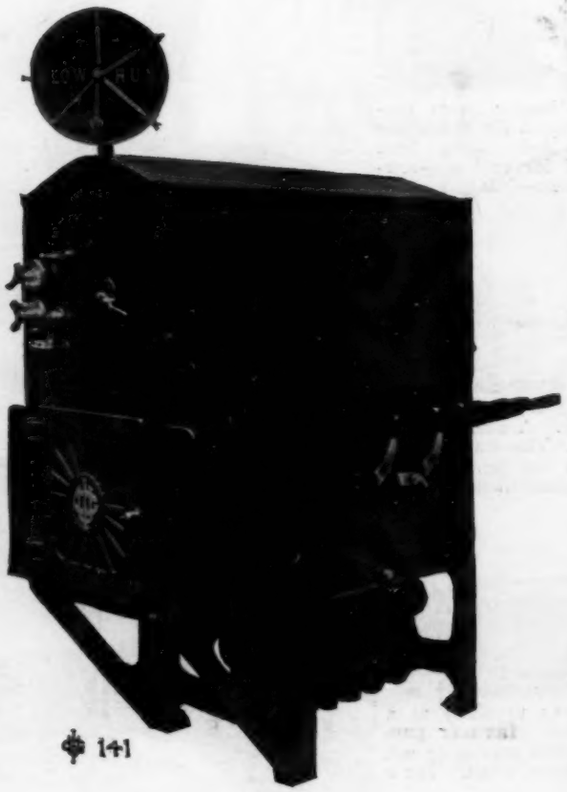
WM. M. CRANE COMPANY

16-20 W. 32nd St. New York, N. Y.

SAFE
AND
SURE

THE U. G. I.
AUTOMATIC CONTROL

146
in
operation
or
on order



U. G. I. AUTOMATIC CONTROLS are daily demonstrating their superiority and reliability in the SAFE and EFFICIENT operation of water gas apparatus.

Uncertainties and hazards were eliminated many years ago—before the Controls were ever offered to purchasers.

THE U. G. I. CONTRACTING CO.

Broad & Arch Sts., Philadelphia
335 Peoples Gas Bldg., Chicago 928 Union Trust Bldg., Pittsburgh

When better meters
can be made

Superior
will make them.

We have made real
mechanical improvements
and not theoretical ones.

The
Superior Meter

A and B Types
All capacities.

SUPERIOR METER CO.
Bush Terminal Bldg. No. 2
BROOKLYN, N. Y.

C. B. BABCOCK CO., Pacific Coast Representatives
768 Mission St., San Fran. isco, Cal.

Superior—All That the Name Implies

From the Atlantic to the Pacific, from Canada to the Gulf of Mexico, gas companies believe in Our
ABILITY TO SERVE

This list of holders contracted for and to be built during 1923 demonstrates their faith in our claim

LIST OF HOLDERS FOR 1923

Philadelphia, Pa.	1	1,500,000 cu. ft. Holder
Duluth, Minn.	1	1,000,000 " " "
Port Arthur, Texas	2	1,000,000 " " "
Staten Island, N. Y.	1	1,000,000 " " "
Charlotte, N. C.	1	500,000 " " "
Denver, Colo.	1	500,000 " " "
San Rafael, Cal.	1	500,000 " " "
Zilwaukee, Mich.	1	500,000 " " "
Geneva, N. Y.	1	500,000 " " "
Herkimer, N. Y.	1	500,000 " " "
Milwaukee, Wis.	1	300,000 " " "
Jackson, Miss.	1	200,000 " " "
Putnam, Conn.	1	150,000 " " "
Mt. Pleasant, Mich.	1	100,000 " " "
Stroudsburg, Pa.	1	100,000 " " "
Zilwaukee, Mich.	1	100,000 " " "
Matoon, Ill.	1	100,000 " " "
Oswego, N. Y.	1	100,000 " " "
Frederick, Md.	1	100,000 " " "
Rawlings, Wyo.	1	100,000 " " "
Watsonville, Cal.	1	50,000 " " "
Shelbyville, Ind.	1	50,000 " " "
Mt. Pleasant, Iowa	1	50,000 " " "
Idaho Falls, Idaho	1	50,000 " " "

STACEY BROTHERS GAS CONSTRUCTION CO.

Engineers and Builders

James E. Stacey, Pres.; Andrew J. Stacey, Vice-Pres.; W. A. Miller, Chief Engineer; Arthur A. Pope, Sec. & Treas.; Wayne Stacey, Gen. Sales Mgr.

CINCINNATI **OHIO**

Pacific Coast Representative
C. B. BABCOCK CO.
San Francisco

New England Representative
EASTERN SERVICE CO.
Boston

Eastern Representative
W. S. GUITTEAU
Room 809
60 Wall St.
NEW YORK CITY

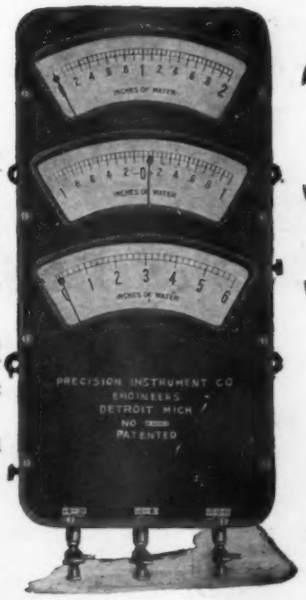
POINTERS

Keep needle "A" low to reduce chimney gas loss due to excess air.

Keep needle "B" near zero on the Draft side; if needle gets on Pressure side the burning gases will be deflected downwards and burn out stoker parts and brickwork.

Keep needle "C" at, say, 3½ inches. If the fire travel of boiler is dirty this cannot be done without forcing "B" on Pressure side.

If a bad hole develops in fuel bed needle "C" falls back to zero.



A—DRAFT AT LAST PASS

B—DRAFT OVER FUEL BED

C—PRESSURE IN WINDBOX

Test cocks for checking accuracy at any point of scale

Patented U. S. Pat. Off.

WHY—Managers and superintendents prefer Precision "3 in 1" Gauges.

Fuel consumption is substantially reduced. Stoker repair bills are almost eliminated. Furnace brickwork repair bills are materially cut.

WHY—Chief engineers and combustion engineers prefer Precision "3 in 1" Gauges.

They cannot get their firemen to use any other kind. They can check entire scale for accuracy in a couple of minutes.

PRECISION INSTRUMENT CO.
NEWARK, N. J.

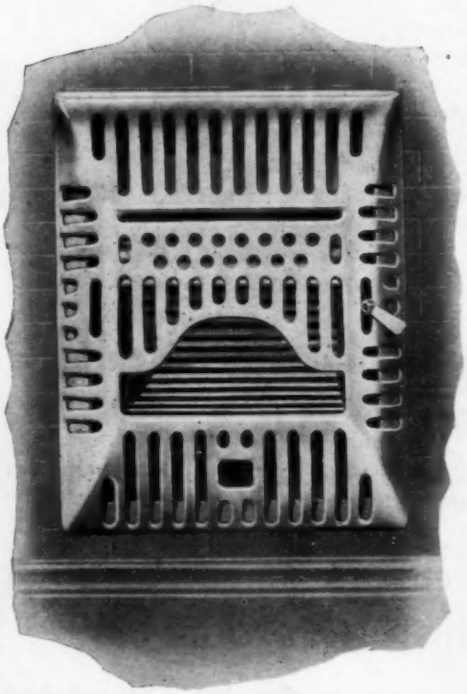
PRECISION
"3 IN ONE"
DRAFT GAUGES

Look for the Name "Precision"

The New
Peerless Wall Heater
is a Great Business-Getter

THE Modern Bath Room is not complete in its equipment unless a Gas Wall Heater is installed. Every home without one is a logical prospect for you. Easily installed. A large roomy chamber below the reflector permits quick connections. The valve is provided with a double key way, easily adjusted to all pressures. The front opening is so designed that the hand can be inserted for lighting.

Perfect combustion without disagreeable odors or poisonous gases is obtained by the use of the open flame burner.



	Inches		Inches
Width of front	15	Width of body in wall	13
Height " "	19	Height " " " "	17
Depth " "	2¼	Depth " " " "	4

A feature of Peerless Construction is the surface of the Heater, which is rounded off into curves which permits of perfect enameling. The design PREVENTS DAMAGE IN SHIPPING AND HANDLING IN INSTALLING.

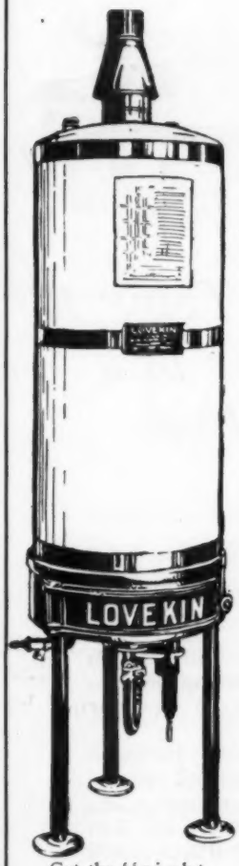
The enameled front is secured to the heater with CONCEALED BOLTS WHICH DO NOT EXTEND THROUGH or COME IN CONTACT WITH THE ENAMELED SURFACE. This insures the enamel from chipping or checking and is one of the many commendable features embodied in Peerless construction.

The reflector is pure copper, and is so placed that a current of cold air is constantly passing through the front openings at the bottom and back of the burner box where it becomes heated, then passes out of the top openings, thus adding greatly to the heating capacity.

That part of the heater inserted in the wall is made of sheet metal, insulated inside with asbestos mill-board.

White enamel is recommended for Bath Rooms. For Bed Rooms, Sun Parlors, Breakfast Rooms, etc., Peerless Wall Heaters can be supplied in Nickel, Bronze, Brass or special finishes.

Peerless Stove and Manufacturing Co.
Columbus, Ohio



Get the "right angle" on the Lovekin Automatic Gas Water Heater. Write for descriptive literature.

The Right Angle

For the Gas Company

The Lovekin Automatic Gas Water Heater combines all of the principles necessary to build up and stabilize the profitable consumption of gas.

Its cleanliness and convenience encourage the liberal use of hot water in the home to the advantage of the consumer. The storage feature tends to level the peaks in the consumption curve during the hours of greatest activity among the housekeepers.

It contributes to the development of public service companies by making service more perfect.

Write for Descriptive Literature.

LOVEKIN WATER HEATER CO.

Main Office and Works—39 to 43 Laurel St., Phila., Pa.
Chicago Office—15 E. Van Buren St.
New York Office—258 Canal Street

Lovekin

ALWAYS HOT WATER READY

Advantages of

The DOHERTY FUEL ECONOMIZER BENCH

Freedom from Clinker Troubles

Uniform Heats

Silica Retorts and Settings

Fuel Economy

Long Service Free From Repair

Low Operating Cost

Increased Capacity

The Improved Equipment Company

Engineers and Builders

24 State Street **New York, N. Y.**

Member American Gas Association

The First Thing to Look For in a Gas Iron

It isn't appearance—it isn't design—it isn't selling features.

It isn't even the material that it is manufactured of.

It is a little word spelled out in raised letters on the top of the iron, and it spells "IMPERIAL."

Find this and you will be assured of fine appearance, perfect and practical design, a great many easy selling features, and above all the very best of material put into its construction from tubing and steel to handle and burners.

You want a gas iron that will not "flare up" and burn the clothes, that is odorless, that heats the bottom first and not the sides, that will stand the hardest usage and almost never comes back for repairs. Then, by all means choose your gas iron by the little word spelled out on the top of the iron—IMPERIAL. Imperial Gas Irons are sold through the best dealers only.

GENERAL SPECIALTY COMPANY

455 Eleventh Avenue

New York City

The Imperial Gas Iron has been known as the Humphrey Iron to the Gas Industry, and embodies, with additional improvements, all the features which made the latter such an outstanding success.

(Roper Dealer Co-operation No. 2 of a Series.)

Come in to see the Roper Ventilated Oven
Special $5 offer on Roper Gas Range with Oven Control
Let the Roper Oven Control cook your dinner
ROPER MEANS less time and more enjoyment in the kitchen
Exclusive Headquarters for Roper Gas Ranges
Treat yourself to a Roper Gas Range
See the Roper Oven Control
Special Sale of Roper Gas Ranges
We put a Genuine Roper in your Home for $5

Roper Retail Newspaper Advertising Service

Roper Retail Advertising Service is designed solely to give the merchant the full sales advantage of Roper National Advertising.

We showed last month that Roper National Advertising appeared before 18,000,000 readers. It appears every month in the year. It is published in 12 Quality Magazines.

Simultaneously with the appearance of this advertising, we furnish Roper Representatives complete newspaper advertisements. Some of these are shown here. They prove to be the link that connects the National Advertising with the representative's store. They enable him to harvest the sales crops we raise in his city for him. Advertising Service sheets go out every two months.

Other sales helps furnished to Roper Representatives will be shown next month. They are already prepared. If you want them, write today.

GEO. D. ROPER CORPORATION, ROCKFORD, ILLINOIS

Pacific Coast Branch: 768 Mission Street, San Francisco, Calif.

ROPER

TRADE MARK REG. U.S. PAT. OFF. REG. IN CANADA

NOTE: BE SURE TO USE THE ROPER TRADEMARK IN YOUR ADVERTISING.

BE SURE THE ROPER PURPLE LINE AND THE ROPER OVEN CONTROL ARE ON THE GAS RANGE YOU SELL

THE J. G. WHITE ENGINEERING CORPORATION

Engineers—Constructors

Industrial Plants, Buildings, Steam Power Plants, Water Powers, Gas Plants, Steam and Electric Railroads, Transmission Systems

43 EXCHANGE PLACE - - NEW YORK

WALTER A. ALLISON

CONSULTING ENGINEER

Specialist in the design, construction and supervision of Gas Properties.

Reports, Appraisals, Rate Development.

403 Wister Street Philadelphia

WILLIAM E. BARRETT

CONSULTING ENGINEER

Member A. S. M. E.—Member A. G. A.—Member N. G. A. A.

Specializing in

Manufactured and Natural Gas Properties—Design, Construction, Operation, Valuations—Reports for Financing or Rate Making—Combustion, Fuels, Oils, Etc.

56 PINE STREET NEW YORK, N. Y.

Unger Ammonia Stills

Make a Superior Concentrate without Salting Lime Supply with Minimum Amount of Water and Attention

JOHN S. UNGER 634 Grace Street Chicago

IRON OXIDE

A prepared iron boring Oxide whose physical properties make it purify at least cost.

LET US SOLVE YOUR PURIFICATION TROUBLES

GAS PURIFYING MATERIALS CO.

FOOT OF HALSEY STREET LONG ISLAND CITY, N. Y.

WILLIAM W. RANDOLPH, M. E.

CONSULTING ENGINEER

EXECUTIVE OFFICES

Broad Street National Bank Bldg.

12 BROAD ST.

RED BANK, N. J.

FUEL TESTS

In addition to the standard tests embracing proximate analyses and heating values, the LABORATORIES are prepared to undertake special investigations such as the determination of the fusing point of ash, the gas yield and quantitative determinations of ammonia, nitrogen, Coal tar, etc. Our facilities are at your service.

ELECTRICAL TESTING LABORATORIES

80th Street and East End Avenue

New York City

DAVIS & FARNUM MFG. CO.

WALTHAM, MASS.

GAS HOLDERS—OIL TANKS

COAL AND WATER GAS EQUIPMENT

CAST IRON FITTINGS AND SPECIALS

MACHINE CASTINGS

A-B GAS RANGES

With Wilder-Metal Rust-Proof Oven Linings

A-B STOVE COMPANY

BATTLE CREEK, MICHIGAN

Russell Engineering Company *St. Louis*

Coal Carbonization Plants, Benches, Repairs, Improvements, Extensions, Apparatus

New York Engineering Company

Designers and Builders of

GAS PLANTS

Scrubbers, Condensers, Purifiers, Riveted and Welded Pipe and Specials

Heavy Plate Metal Work a Specialty

New York Engineering Company

Office: 2 Rector St., New York Works: Yonkers, N. Y.

Fred W. Freese & Co.

ENGINEERS

Financing—Building—Managing and Operating Gas, Electric and Water Properties

Refinancing and Rebuilding Existing Plants

Accounting—Valuations—Appraisals

Rates, Counsel and Commercial

First National Bank Building

Chicago

WILLIAM A. BAEHR ORGANIZATION

ENGINEERS

Specializing in Public Utilities

Management, Operation, Construction, Plans, Reports, Valuation, Rates, Public Relations, Accounting, Purchasing

Illinois Merchants Bank Bldg.

CHICAGO

Byllesby Engineering and Management Corporation

208 S. La Salle Street

Chicago

New York Tacoma

Pittsburg Water Heaters

Industrial Managers

Tell every prospect for core ovens—tempering ovens—annealing ovens—enameling ovens—japanning ovens—drying ovens—lacquering ovens—lithographing ovens about

Maehler Gas Ovens

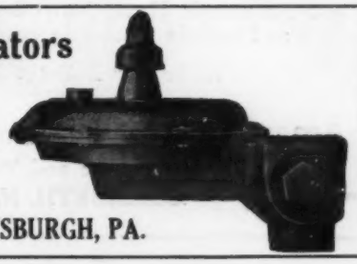
The Paul Maehler Company 2210 W. Lake St., Chicago, Ill.

"EMCO" Meters and Regulators

For Artificial and Natural Gas

Meters for Low and High Pressure.
Proportional Meters, Provers, Gauges and Burners.
Regulators of all kinds.

Write for Catalog and Prices.



EQUITABLE METER CO. 432-34-36 First Avenue PITTSBURGH, PA.

They Don't Allow Their Name Used In an Ad.

The Wrigley Chewing Gum people of Chicago asked us for the names of folks using Ridgway Elevators of over 5000 pounds capacity and over 70 feet lift.

Among the many names we furnished the Wrigley Co. was one of the Biggest, Richest and Best Known Companies in the land. Wrigleys apparently have written to Ridgway Elevator users. Here is what this great company wrote:

We will furnish the name on application—

New York, April 12, 1923.

Wm. Wrigley, Jr. Co.,
400 No. Michigan Ave., Chicago.
Gentlemen:— Attention Mr. W. B. Ranney.

Replying to your letter of April 9, regarding the Ridgway Steam Hydraulic Elevator, I would say I do not know of any elevator that is comparable with the Ridgway Elevator from the viewpoint of INITIAL COST, MAINTENANCE and RELIABILITY.

We use the Ridgway Elevator at all our plants EXCLUSIVELY and to our EMINENT SATISFACTION.

Further, I know that you will find these people most extraordinary for their honesty and willingness to serve and absolutely reliable.

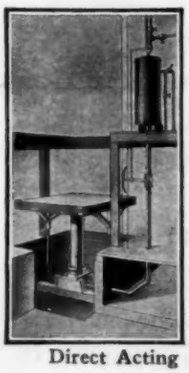
Trusting this information will serve your purpose.
Yours truly,
(Name furnished on request.)

This is how folks who are not "DEAD ONES" are affected when they

Who, when they have an elevator proposition, never fail to

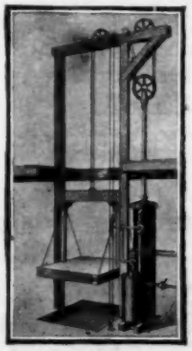
"HOOK 'ER TO THE BILER"

CRAIG RIDGWAY & SON CO., Coatesville, Pa.
ELEVATOR MAKERS TO FOLKS WHO KNOW

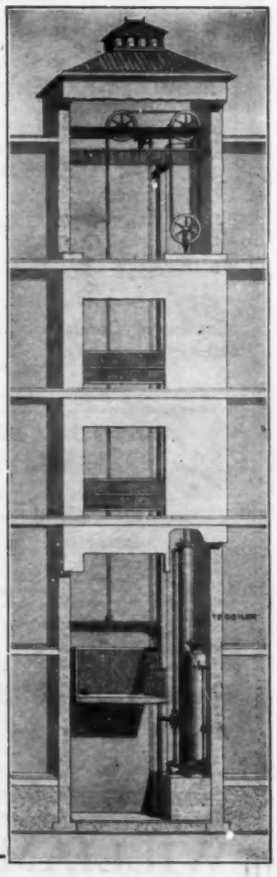


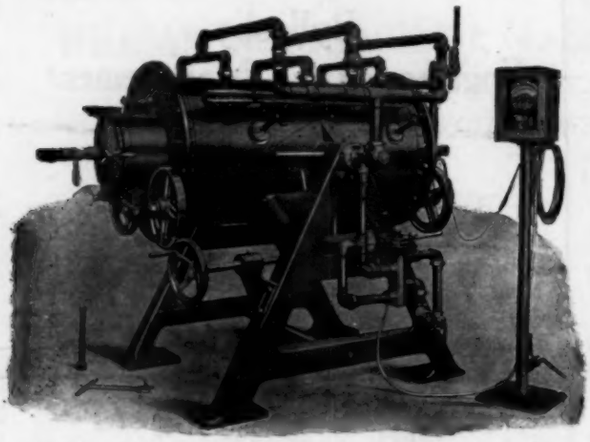
Direct Acting

OVER 3000 IN DAILY USE



Double Geared





No. 2-A Carbonizing Machine with Automatic Temperature Controller.

NO MORE GUESSWORK

Our Gas Carbonizing Machines, together with our Automatic Heat Controllers, produce accurate and certain results in case-hardening.

Write for Bulletin No. 12.

American Gas Furnace Company
Main Office and Works
ELIZABETH, N. J.

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW
VALVE MANUFACTURING COMPANY
TROY, N. Y.

New York 62 Gold Street | Boston Oliver Building | Philadelphia Harrison Building
Chicago The Rookery | Pittsburg First Nat. Bank Building | Kansas City R. A. Long Bldg.

The Two Best Friends of Gas

THE two best friends of gas are Efficient Appliances and Intelligent Publicity. Without a doubt the Lorain Oven Heat Regulator leads all devices designed to give the Public exceptional service from the use of gas. Moreover, no other gas appliance is, or ever has been, given wider publicity.

Into every school in the United States where Domestic Science is taught, we have carried the propaganda of "Gas as the Preferred Fuel for Cooking," and today over 700 of the Nation's leading schools and universities are using Lorain-equipped Gas Ranges for cookery instruction.

In addition, American Stove Company maintains an Experimental Kitchen in charge of a nationally known domestic science expert, where a great work is constantly being carried on in behalf of the Gas Industry.

Among the many new and improved cooking methods developed by American Stove Company is Oven Canning. This one feature alone has been the means of selling thousands upon thousands of Lorain-equipped Gas Ranges—and *that* during the summer season when gas range sales are supposed to be at a low ebb.

Every individual and corporation that has any financial interest in the Gas Industry should be fully posted on The Lorain Oven Heat Regulator and the good it is accomplishing for the Industry and for the American Housewife. You can get any facts you want from

AMERICAN STOVE CO.
ST. LOUIS, MO.

LORAIN
OVEN HEAT REGULATOR

More than 70,000,000 Copies of the following Publications will Carry Advertisements of the Lorain Oven Heat Regulator During 1923

Pictorial Review	Delineator and Designer	American Cookery
Saturday Evening Post	Cosmopolitan	Forecast
American Magazine	Good Housekeeping	National Builder
Woman's Home Companion	Red Book	Architectural Record
McCall's Magazine	Modern Priscilla	Journal of Home Economics

American Architect and Architectural Review

In addition to this tremendous national campaign, some 15,000 Gas Companies, Hardware Dealers, Furniture Dealers, Department Stores, and Stove Dealers are constantly advertising in local newspapers to keep the public informed where to buy Gas Ranges equipped with the famous Lorain Oven Heat Regulator.

The several divisions of American Stove Company are at all times prepared to render valuable sales and advertising assistance to those who sell their product.

Mats and electros of newspaper advertisements are furnished free of charge, a new series being offered each month through the pages of Magic Chef, the national dealer-house-organ.

Canning charts, booklets, folders, and envelope inserts, printed in attractive colors, can be had in any reasonable quantity, free of charge.

Handsome, lithographed window trims, display cards, movie slides, etc., are issued at frequent intervals and at no cost to the dealer.

You should take advantage of these valuable and free sales-helps. They will help you to sell more Lorain-equipped Gas Ranges which will in turn increase the satisfaction which your consumers are deriving from the use of gas.

AMERICAN STOVE COMPANY
ST. LOUIS, MO.

QUICK MEAL
Quick Meal Stove Company Div.,
St. Louis, Mo.

RELIABLE
Reliable Stove Company Div.
Cleveland, Ohio

NEW PROCESS
New Process Stove Company Div.
Cleveland, Ohio

DIRECT ACTION
National Stove Company Div.
Lorain, Ohio

DANGLER
Dangler Stove Company Div.
Cleveland, Ohio

CLARK JEWEL
George M. Clark & Co. Div.
Chicago, Ill.

Established 1858 Incorporated 1890

J. H. GAUTIER & CO.

OLIVER W. BIRD, JR., Pres.
Jersey City, N. J.

COAL GAS BENCHES

Silica Retorts and Settings
Clay Gas Retorts Fire Brick
Water Gas Linings, Etc.
Cement—To Suit Specifications

THE KEMP

Automatic Gas System

assures the correct heat application.
Nothing is more important.

THE C.M. KEMP MFG. CO.
BALTIMORE, MD. 405-415 E OLIVER STREET

JNO. DELL, Pres. and Gen. Mgr. Established 1882

MISSOURI FIRE BRICK CO.

ST. LOUIS, MO.
Manufacturers, Designers and Constructors of Gas Benches
With Either Clay or Silica Retorts
Checker Brick and Water Gas Linings

THE WESTMORELAND COAL COMPANY

CHARTERED 1854

Mines situated on the Pennsylvania and the Baltimore and Ohio Railroads, in Westmoreland County, Pa.

POINTS OF SHIPMENT: PHILADELPHIA, BALTIMORE, SOUTH AMBOY, N. J.

Since the commencement of operations by this Company its well-known Coal has been largely used by the Gas Companies of New England and the Middle States, and its character is established as having no superior in gas-giving qualities, and in freedom from sulphur and other impurities.

PRINCIPAL OFFICE, 224 SOUTH THIRD STREET, PHILADELPHIA, PA.

HIGH PRESSURE

COMBINATION STYLE
(With Mercury Seal)

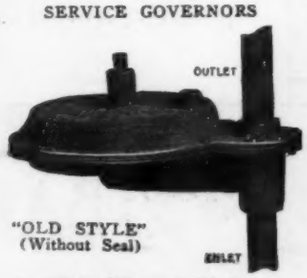
Pacific Coast Representative
C. B. BABCOCK CO.
No. 768 Mission Street
San Francisco

REYNOLD'S

ARTIFICIAL GAS GOVERNORS
and
NATURAL GAS REGULATORS
For All Kinds of Pressure Reduction
Write for catalog

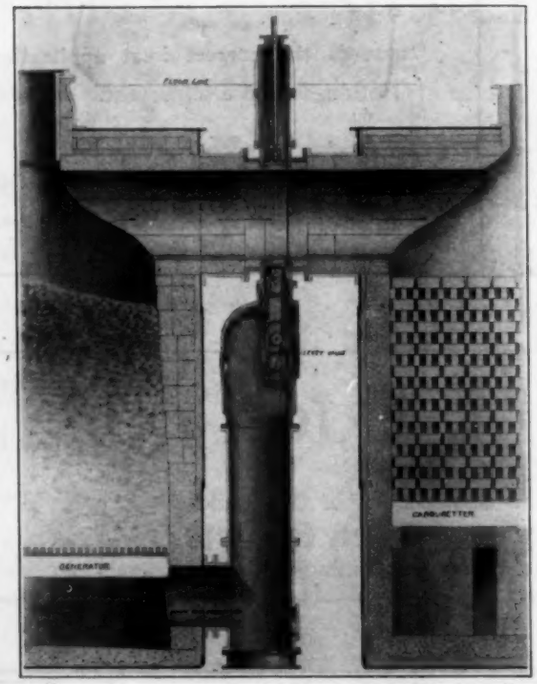
Reynold's Gas Regulator Co.

SERVICE GOVERNORS



"OLD STYLE"
(Without Seal)

Main Office and Works
ANDERSON, INDIANA

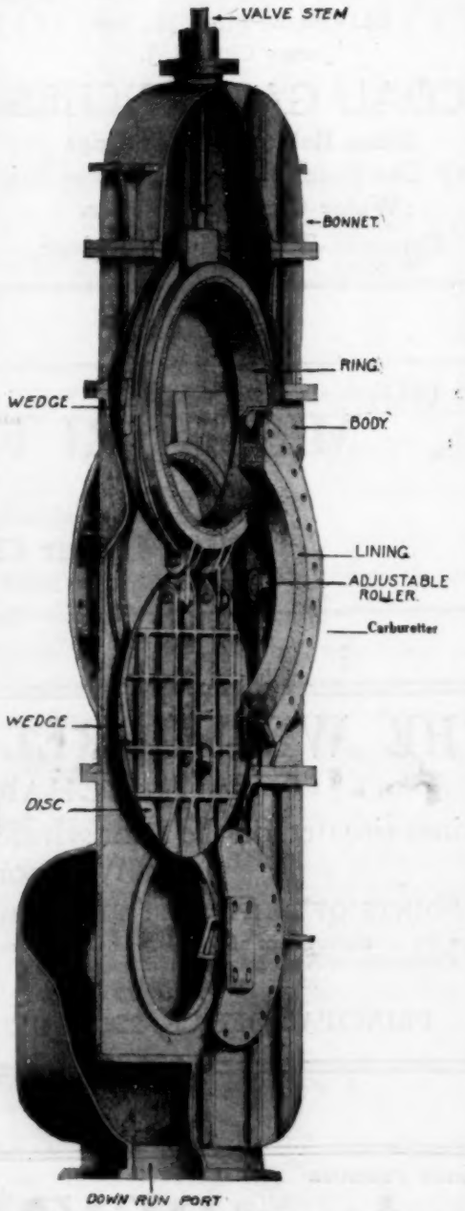


Levey Type of Hot Valve for Carburetted Water Gas Sets

Built in all sizes with either hand or hydraulic operating mechanism.

Performs in one valve and with one disc, the functions taken care of by the old style of Hot Valves, which made necessary two (2) valves per machine.

Adjustable wedges make it possible to keep the valve tight at all times and insure proper operation of sets.



VALVE DISC SHOWN AT HALF STROKE

The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE NEW YORK

Three New Styles of Welsbach Heaters

Leaders for Next Season's Business

The influence of Welsbach advertising plus dealer enthusiasm have resulted this year in an unprecedented sale of Welsbach Heaters. For next season three new styles will be ready to increase Welsbach Gas Heater popularity.

The Nos. 29 and 27, equipped with andirons, and the new No. 31 have been designed to enable you to offer Welsbach efficiency, economy and convenience in every required size and style of heater. The complete Welsbach line will enable you best to put across to your customers the Welsbach message of "comfort plus economy."

The No. 29 fireplace model, equipped with andirons. Finished in either oxidized brass or oxidized copper, its beautifully balanced, sturdy appearance will make this heater sell itself.

Here is the capable, business-like No. 27 equipped with andirons. It has grace and refinement—a handsome, appropriate model for any fireplace. Oxidized brass or oxidized copper finish gives color to its appearance.

Backed by our Vast Knowledge and Experience

it is only natural that Welsbach Heaters should contain every feature that helps toward maximum heat production and greatest economy. To the special burner and glowers is due the unsurpassed volume of heat. A copper reflector prevents waste and sends all this warmth out into the room.

The high quality of the materials used, the splendid workmanship, the instantaneous, convenient, self-lighting service make Welsbach Heaters the final word in auxiliary heating perfection.

Serve Your Interests by Giving Your Customers the Best

Your customers look to you to tell them what is best. Serve your interests and theirs by giving them Welsbach Service.

Make next season the biggest heater year you ever had by planning now to get your share of Welsbach Gas Heater business.

No. 31

Our new seven-glower model. A heater chock full of energy and life. Compact size and light weight make it a heater of all-round usefulness, an ideal type for small room heating and emergency use.

WELSBACH COMPANY
Gloucester, N. J.

Member American Gas Association

LIGHTING FIXTURES
GAS MANTLES GAS HEATERS

Welsbach PRODUCTS

CLASSIFIED ADVERTISEMENTS

Rate at **$3.00** per inch for first insertion, **$2.00** per inch for each additional insertion of same copy. Positions wanted—**$1.00** per issue.

POSITIONS WANTED

WANTED.—Position as superintendent of coal gas plant in the South or West. Services available about July 15th. Ten years' experience. Address P. O. Box 595, care of American Gas Journal, 53 Park Place, N. Y. City.

Wanted.—Twenty years' practical experience, natural and artificial gas, installing mains, services, regulators, governors, house piping, meters, industrial and domestic fuel appliance. Repairing and testing domestic proportional or orifice meters. At present employed; desire change. Address P. B. Box 596, care American Gas Journal, 53 Park place, New York City.

Chemical Engineer—12 years' experience in Public Utilities. Has held positions in executive capacity as chief chemist and engineer of tests. Has a successful record of several years of research work on problems pertaining to the gas industry and electric power plants. At present connected with one of the largest gas companies in the country as industrial fuel engineer. Desires a position of responsibility with a progressive organization. Address P. O. Box 586, care of American Gas Journal, 53 Park Place, New York City.

FOR SALE

1 5-ft. Carburetted Water Gas Set, consisting of:
1 Generator 5 ft. dia. x 10 ft. high, ¼ in. plate.
2 doors for cleaning fire.
2 doors for ash pit.
1 Carburetter 4 ft. 8 in. dia. x 11 ft. high, ¼ in. plate.
1 Superheater 5 ft. dia. x 19 ft. high with lever operated stack valve.
1 seal and wash box 4 ft. dia. x 2 ft. 4 in. high.
1 Tower Scrubber 3 ft. dia. x 17 ft. high, including steam, water, oil and blast piping to connect.
Inquire: Purchasing Department, the Detroit Edison Co., 2000 2nd Ave., Detroit, Mich.

FOR SALE

Bound volumes of the American Gas Journal from 1896 to 1914, inclusive, and unbound volumes from 1915 to 1920, inclusive. Address Box 598, care American Gas Journal, 53 Park Place, New York City.

POSITIONS OPEN

WANTED—Gas appliance salesman in a good city, a good company, a good salary for a good man. Address P. O. Box 591, care of American Gas Journal, 53 Park Place, New York City.

WANTED TO BUY

WANTED—1 No. 4 second hand Roots Exhauster, on Bed Plate direct connected to Engine. State condition, time of service, location and price. Address Box 597, care of American Gas Journal, 53 Park Place, New York City.

UTILIZE YOUR GAS LIQUOR
NO EXTRA LABOR OR OPERATING EXPENSES
Improved AMMONIA Concentrator
About 130 in use. Write to
STROH & OSIUS, Patentees
MICHIGAN AMMONIA WORKS, Detroit, Mich

KELLER ADJUSTABLE COKE CRUSHER
Strong, Simple, Durable. Will Crush any Size Desired.
C. M. KELLER
COLUMBUS, IND.
Correspondence Solicited

Cox Computers Save Time and Worry
For low pressures—$2.50 For high pressures—$5.00
ORDERS FILLED IMMEDIATELY
AMERICAN GAS JOURNAL 53 Park Place, N. Y.

PURIFYING MATERIAL, — BAGGED OR BULK
Manufacturers of GOVERNORS, APPARATUS and EQUIPMENT
IRON Connelly Iron Sponge and Governor Co. New York, Chicago U.S.A. SPONGE

STUPAKOFF LABORATORIES
PITTSBURGH PENNSYLVANIA
Manufacturers of
TEMPERATURE INDICATING and RECORDING INSTRUMENT

Journal Ads Produce Results
To get in touch with the right man to fill the vacancy in your organization, advertise in the Classified Columns of the American Gas Journal.

BARGAINS

Two No. 6-B Sturt. Turbines; Two No. 6 Des. 4 in. Blowers, 6000 C. F. M. at 42 in. Direct connected. 3 yrs.—1 at $650; 1 at $500.

Two No. 6 C. D. Sturt. Blowers; Two 72 H.P. Terry Turbines, twenty-four in. Pressure. Good condition.

One 9x14x11 Simplex Franklin Gas Compressor. 314 C. F. M. at 30 lbs.

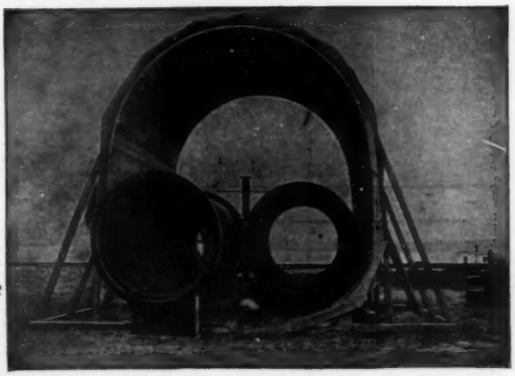
One 10x14x10 Duplex Clayton Gas Compressor, 354 C. F. M. at 40 lbs.

750,000 C. F. Coal Gas Condensing System, consisting of 3 Condensers, 1 Exhauster, 1 Tar Extractor, 1 Washer, 1 Rotary Scrubber.

Part or Whole. ALL GOOD.

All Sizes and Makes of Used Gas Equipment Bought and Sold on Flat or Percentage Basis.

EQUIPMENT EXCHANGE
BULLITT BUILDING
PHILADELPHIA, PA.



Model of Astoria Tunnel with 72-inch Gas Pipe in ac

U.S. CAST IRON GAS PIPE
In the Astoria Tunnel

Two lines of "The Pipe That Outlasts the Ages" were laid side by side as shown in the picture.

Cast Iron pipe has a record of 250 years of excellent service. The first length of cast iron pipe ever made is still in use. The first piece of cast iron pipe ever laid in this country is still in use.

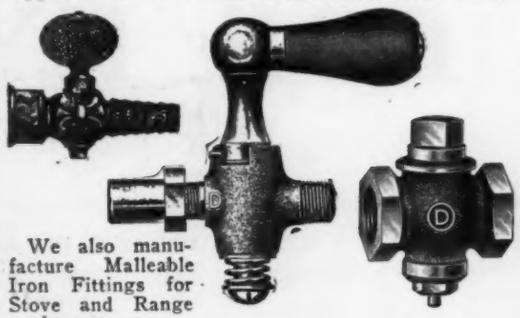
Don't overlook these facts when deciding upon the pipe for your next extensions or new gain mains.

UNITED STATES CAST IRON PIPE AND FOUNDRY COMPANY
724 E. Pearl Street, Burlington, N. J.

The Dependable Line

We make Gas Cocks of every description to conform with the A. G. A. and U. G. I. specifications, and to fit any manufacturer's particular requirements.

We make a full line of Gas Hose Cocks and Gas Service Cocks—all sizes and styles. Gas Mixers—Hose Nipples and Mixer Pins. Brass Valves of all kinds.



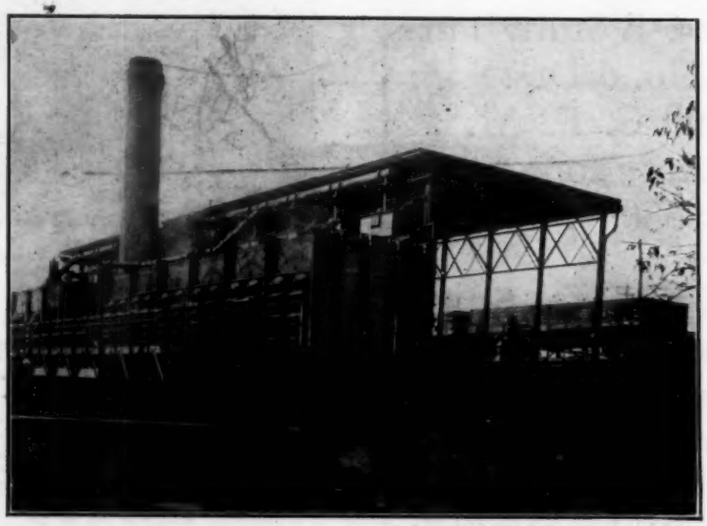
We also manufacture Malleable Iron Fittings for Stove and Range equipment.

Detroit Brass & Malleable Works
(formerly Detroit Valve & Fittings and Detroit Brass Works)
Holden & Greenwood Avenues, DETROIT, MICH.
New York Office (Metropolitan District Only): 66 Cliff Street
H. Romeyn Smith, Eastern Sales Manager
W. T. Mayfield
(Southern Representative East of Mississippi River)
American Trust Bldg., Birmingham, Ala.

Think of Parker-Russell First When You Think of

COAL GAS BENCHES

A Battery of Coal Gas Benches at Macon, Ga.



Designed and Erected by the Parker - Russell Co.

THE PARKER-RUSSELL COMPANY

LACLEDE GAS BLDG. ST. LOUIS, MO.

Builders of Complete Coal Carbonization Plants

Why

294 good gas engineers have complete confidence in their selection of

IRON HYDROXIDE

as the perfect purifying material

IRON HYDROXIDE purifies most gas at one change and its life is longest in the field of purifying materials, hence 294 gas companies are using it today with complete satisfaction.

Write for performance data regarding IRON HYDROXIDE and note how its use will increase the capacity of your purifiers

IRON HYDROXIDE COMPANY

Paschal Station **Philadelphia**

LOGAN COUNTY COAL CORPORATION

SUCCESSORS TO

AMHERST FUEL COMPANY

PRODUCERS

HIGH GRADE GAS COAL

MINES LOCATED IN

LOGAN COUNTY

WEST VIRGINIA

GENERAL SALES OFFICES

UNION CENTRAL BUILDING

CINCINNATI

Members

American Gas Association

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THE GAS MACHINERY CO.,

CLEVELAND, OHIO.

COAL AND WATER GAS APPARATUS,

BENCHES,
BY-PRODUCT GAS OVENS,
PURIFIERS,
AMMONIA CONCENTRATORS,
TAR EXTRACTORS,
VALVES AND CONNECTIONS,
WASHERS,

COMPLETE GAS PLANTS,

BY-PRODUCT AND SPECIAL MACHINERY.

No 787

SPRAGUE METERS

No. 1-A METER

Represent twenty years of progress

Send for bulletin No. 7

SPRAGUE METER CO.

BRIDGEPORT, CONN.

Los Angeles San Francisco Davenport, Ia.

METERS

For Measuring
Production and Distribution
of

Oil — Gasoline — Gas

and Other Fluids

PITTSBURGH METER COMPANY
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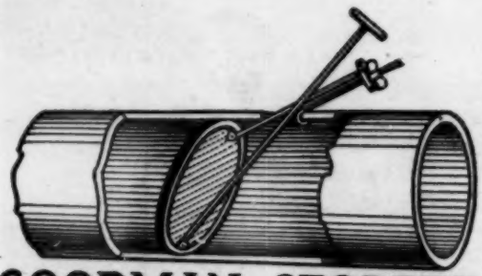
Chicago—5 So. Wabash Ave. Seattle—4038 Arcade Building
Kansas City—Mutual Bldg. Los Angeles—Union Bk. Bldg.

Street Department Necessities

GOODMAN STOPPERS



GOODMAN STOPPER

When shutting off street mains the SAFEST and SUREST WAY is to use a Goodman Stopper. Once inserted it is like a plug.

DEPENDABLE GAS MAIN BAGS

Built in Three Types

TYPE A—Invisible Seam or Seamless Bag.
TYPE B—Reinforced Seams, heavier and stronger than Type A.
TYPE C—Canvas Covered Bags for use in Mains coated with Tar or Oil.

Sold subject to your inspection and approval
When ordering, specify Type wanted

Test Main Plugs, Service Plugs, Wooden Plugs, Asbestos Joint Runners, Lead Melting Furnaces, oil and coke burning, Pressure Gauges, etc., carried in stock.

SAFETY GAS MAIN STOPPER CO.

523 Atlantic Avenue Brooklyn, N. Y.

Pacific Coast Representative:
C. B. Babcock Company, 768 Mission Street, San Francisco, Cal.

ACME GAS COCKS

GAS COCKS FOR ALL PURPOSES

WE manufacture a large variety of styles and sizes of gas cocks for ranges, hot plates, water heaters and other gas appliances. Made according to all specifications, including A. G. A. and U. G. I.

Our methods of manufacture assure you a high grade product at a minimum cost.

The modern manufacturing facilities contained in our plant in Detroit, enable us to take care of customers and make prompt shipments in a manner that we consider to be unexcelled.

We will be glad to send you a booklet showing the different styles, sizes and prices of Acme Gas Cocks. Consult us as to your Gas Cock Requirements.

Acme Brass Works

8211 Collins Avenue and
Belt Line R. R.

DETROIT, MICH.

IN every fourth issue of the Saturday Evening Post you will find a full page in colors advertising the Humphrey Radiantfire.

This campaign is continuous—in season and out of season. It is a major unit of our permanent national advertising policy.

It is unnecessary to point out the advantages of selling a product that is so well known in the best American homes.

GENERAL GAS LIGHT CO.

KALAMAZOO

44 WEST BROADWAY
NEW YORK
768 MISSION STREET
SAN FRANCISCO

PITTSBURGH BUFFALO CINCINNATI ATLANTIC CITY

The HUMPHREY
Radiantfire
TRADE MARK REG. U.S. PAT. OFF.

FUSETITE

A high grade bond cement

FOR LAYING UP AND PATCHING ALL KINDS OF REFRACTORY MATERIAL

FUSETITE
Sets hard and bonds in atmospheric temperatures

FUSETITE
Neither shrinks nor expands

FUSETITE
Becomes a dense hard structure at average furnace temperatures

FUSEITE M
Has a fusing point of 3000° F.

FUSETITE H
Has a fusing point of 3350° F.

FUSETITE
is recommended for

Boiler Furnaces	Oil Stills
Annealing Furnaces	Water Gas Generators
Hardening Furnaces	Coal Gas Benches
Heat Treating Furnaces	Coke Ovens
Producer Gas Generators	Pit Flues, etc.

Fusetite will solve your furnace troubles

It may be obtained from the manufacturers

JAMES GARDNER, Jr. CO.
EBENSBURG, PENNSYLVANIA

REDUCING REGULATOR

for Extremely High Pressure

WE make High Pressure or Reducing Regulators to withstand and control the highest pressures known; and have them in use where it reaches the enormous pressure of 2,000 pounds to the square inch. We can furnish these regulators for any inlet pressure, reducing to any given outlet pressure from 5 pounds to 300 pounds.

Our regular line of High Pressure Regulators may be used on any inlet pressure up to 600 pounds. For higher pressures we make a special class of regulators, for which special prices will be quoted on application.

High Pressure Regulators are made in all sizes up to 24 inches.

THE CHAPLIN-FULTON MANUFACTURING COMPANY
Pittsburgh . . Pa.

Buyers Reference Index

See page 39 for advertisements of these products

AMMONIA CONCENTRATORS
Michigan Ammonia Works

AMMONIA STILLS
Unger, John S.

ANNEALING MACHINES
Rotary
American Gas Furnace Co.

BAFFLES
Quigley Furnace Specialties Co.

BAGS
Gas
Safety Gas Main Stopper Co.
See also Stoppers.

BENCHES
Complete
Bartlett-Hayward Co.
Davis & Farnum Mfg. Co.
Gas Machinery Co.
Gardner, James, Jr., Co.
Gautier & Co., J. H.
Improved Equipment Co.
Missouri Firebrick Co.
Isbell-Porter Co.
Parker-Russell Mining & Manufacturing Co.
Russell Engineering Co.
Stacey Brothers Gas Constr. Co.
Steere Engineering Co.
Western Gas Construction Co.
West Gas Improvement Co.

BENZOL
Bartlett-Hayward Co.
Gas Machinery Co.
Koppers Co., The
Western Gas Construction Co.

BLOWERS
Pressure
American Gas Furnace Co.
Connersville Blower Co., The

BOILER GRAPHITE
Dixon Crucible Co., Joseph

BOILERS
New York Engineering Co.

BOOSTERS
Connersville Blower Co., The
American Gas Furnace Co.

BURNERS (Industrial)
Surface Combustion Co.
Fuel
American Gas Furnace Co.
Connelly Iron Sponge & Gov. Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Gas Machinery Co.
Koppers Co., The
Steere Engineering Co.
Western Gas Construction Co.

CALORIMETERS
American Meter Co., Inc.
Precision Instrument Co.
Stupakoff Laboratories

CEMENTS
Jos. Dixon Crucible Co.
Gardner, James, Jr., Co.
Gautier & Co., J. H.
Gerould, C. L.
Improved Equipment Co.
Parker-Russell Min. & Mfg. Co.
Quigley Furnace Specialties Co.

CHARGING MACHINERY
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Davis & Farnum Mfg. Co.
Hunt, C. W. Co.
Improved Equipment Co.
Isbell-Porter Co.
Parker-Russell Min. & Mfg. Co.
Stacey Manufacturing Co., The
Gas Machinery Co.
Stacey Bros. Gas Construction Co.

COCKS
Acme Brass Works
Detroit Brass & Malleable Co.
Johnson Gas Appliance Co.

COALS
Logan County Coal Corpn.
Westmoreland Coal Co.

COAL GAS APPARATUS
Bartlett-Hayward Co.
Davis & Farnum Mfg. Co.
Gas Machinery Co.
Improved Equipment Co.
Isbell-Porter Co.
Koppers Co., The
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.
Stacey Bros. Gas Constr. Co.
Stacey Manufacturing Co., The
United Gas Improvement Co.
Western Gas Construction Co.
West Gas Improvement Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Isbell-Porter Co.
Hunt Co., C. W.
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.

COKE CRUSHERS
Bartlett-Hayward Co.
Keller, C. M.

COKE OVENS
Koppers Co., The

COMPUTERS
United Gas Improvement Co.
Low Pressure
Cox—American Gas Journal
Fox—American Gas Journal
High Pressure
Cox—American Gas Journal

CONDENSERS
See Purifiers

CONVEYORS
Bartlett-Hayward Co.
Davis & Farnum Mfg. Co.
Gas Machinery Co.
Hunt, C. W., Co.
Isbell-Porter Co.
Stacey Bros. Gas Constr. Co.
Stacey Manufacturing Co., The
Western Gas Construction Co.

CONCENTRATORS—AMMONIA
Michigan Ammonia Works

DERRICKS—PIPE
Safety Gas Main Stopper Co.

DIES
Nye Tool & Machine Works

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Hunt, C. W. Mfg. Co.
Improved Equipment Co.
Isbell-Porter Co.

DRIP PUMP BOX
Keller, C. M.

ELEVATORS
Ridgway, Craig, & Sons

ENGINEERS
Combustion
Improved Equipment Co.
Parker-Russell Min. & Mfg. Co.
Surface Combustion Co.
Consulting
Allison, Walter A.
Baehr, W. A.
Byllesby & Co., H. M.
Freese, Fred W.
Gellert Engineering Co.
Improved Equipment Co.
Randolph, W. W.
White, J. G. Engineering Corp.
Contracting
Baehr, W. A.
Barrett, William E.
Bartlett-Hayward Co.
Byllesby & Co., H. M.
Cruse-Kemper Co.
Davis & Farnum Mfg. Co.
Freese, Fred W.
Gas Machinery Co.
Improved Equipment Co.
Isbell-Porter Co.
Koppers Co., The
Parker-Russell Min. & Mfg. Co.
Randolph, Wm. W.
Russell Engineering Co.
Stacey Bros., Gas Constr. Co.
Stacey Manufacturing Co., The
Steere Engineering Co.
United Gas Improvement Co.
Western Gas Construction Co.

EXHAUSTERS
Connersville Blower Co., The
Davis & Farnum Mfg. Co.
Gas Machinery Co.
Isbell-Porter Co.
Western Gas Construction Co.

FIREBRICK—CHECKER BRICK
Gas Machinery Co.
Gardner, James, Jr., Co.
Gautier & Co., J. H.
Improved Equipment Co.
Missouri Firebrick Co.
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.

FITTINGS
Donaldson Iron Co.
Steere Engineering Co.
Western Gas Construction Co.
U. G. I. Contracting Co.

FIXTURES
General Gas Light Co.
Gleason, E. P., Mfg. Co.
Welsbach St. Lt. Co. of Amer.
Welsbach Co.

FURNACES (Case Hardening)
American Gas Furnace Co.
Improved Equipment Co.
Surface Combustion Co.

GAS ANALYSIS APPARATUS
United Gas Improvement Co.

GAS PLANTS, COMPLETE
Bartlett-Hayward Co.
Davis & Farnum Mfg. Co.
Gas Machinery Co.
Improved Equipment Co.
Isbell-Porter Co.
Koppers Co., The
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.
Stacey Manufacturing Co., The
Stacey Bros. Gas Constr. Co.
United Gas Improvement Co.
Western Gas Construction Co.
West Gas Improvement Co.

GAS-TESTING APPARATUS
American Meter Co., Inc.
Equitable Meter Co.
Lambert Meter Co.
Superior Meter Co.
Sprague Meter Co.

GAUGES
Draft
Precision Instrument Co.
Pressure-Recording
American Meter Co., Inc.
Connelly Iron Sponge & Governor Co.
Helme & McIlhenny
Lambert Meter Co.
McDonald & Co., D.
Pittsburgh Meter Co.
Precision Instrument Co.
Superior Meter Co.
Sprague Meter Co.
United Gas Improvement Co.

GLASSWARE
Globes, Shades and Bowls
Welsbach Co.
Gleason, E. P., Mfg. Co.

GLOBES, GAS
Gleason, E. P., Mfg. Co.
Welsbach Co.

GOVERNORS
American Meter Co., Inc.
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Davis & Farnum Mfg. Co.
Equitable Meter Co.
Reynolds Gas Regulator Co.

Automatic
Equitable Meter Co.
Steere Engineering Co.

Coke Oven
Equitable Meter Co.
Gas Machinery Co.
Steere Engineering Co.

District
Helme & McIlhenny
Isbell-Porter Co.
Steere Engineering Co.

Exhauster
Connelly Iron Sponge & Gov. Co.
Isbell-Porter Co.

High Pressure
Chaplin-Fulton Mfg. Co.
Reynolds Gas Regulator Co.
Sprague Meter Co.

Low Pressure
Chaplin-Fulton Mfg. Co.
Reynolds Gas Regulator Co.

Retort House
Gas Machinery Co.
Isbell-Porter Co.
Steere Engineering Co.
Western Gas Construction Co.

Service
Chaplin-Fulton Mfg. Co.
Equitable Meter Co.
Gas Machinery Co.
Sprague Meter Co.

Station
Equitable Meter Co.
Gas Machinery Co.
Helme & McIlhenny
Reynolds Gas Regulator Co.
Station Automatic
Gas Machinery Co.
Western Gas Construction Co.

HEATERS (WATER)
Geyser Sales Co.
Hoffman Heater Co.
Lovekin Water Heater
Pittsburg Water Heater Co.

HEATERS—ROOM
Crane Co., Wm. M.
General Gas Light Co.
Radiant Heat Corpn. of Amer.
Welsbach Company

HEATING MACHINES
American Gas Furnace Co.

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Davis & Farnum Mfg. Co.
Stacey Bros. Gas Constr. Co.
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Buyers' Reference Index

See page 39 for advertisements of these products

INDUSTRIAL FUEL APPLIANCES
American Gas Furnace Co.
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General Gas Light Co.
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Connersville Blower Co.
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Maryland Meter Works
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American Meter Co., Inc.
Cleveland Gas Meter Co.
Griffin & Co., John J.
Helme & McIlhenny
Maryland Meter Works
McDonald & Co., D.
Tufts, Nathaniel, Meter Co.
Sprague Meter Co.
Station
American Meter Co., Inc.
Builders Iron Foundry.
Connersville Blower Co.
Griffin & Co., John J.
Helme & McIlhenny
Maryland Meters Works
McDonald & Co.
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American Meter Co., Inc.
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American Meter Co., Inc.

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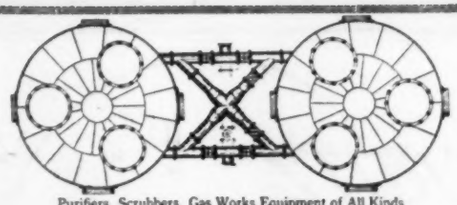

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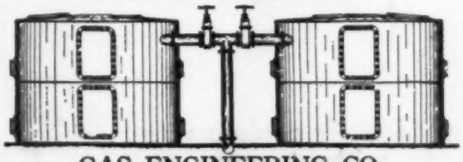

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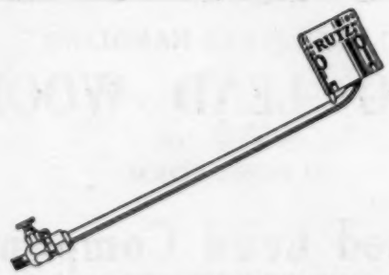

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A. B. Stove Co. 18
Acme Brass Works 31
Allison, Walter A. 18
Alpha-Lux Co. 37
American Gas Furnace Co. 20
American Iron Machine Co. 6
American Meter Co. ..... —
American Mineral Products & Color Co., Ltd. .... —
American Stove Co. ....21 and 22

Baehr, Wm. A. 19
Bartlett-Hayward Co. 24
Barrett, Wm. E. 18
Byllesby & Co., H. M. 19
Benson Mfg. Co. 38
Builders Iron Foundry 37

Chaplin-Fulton Mfg. Co. 33
Chicago Dryer Co. ..... —
Cleveland Gas Meter Co. ..... —
Clow, J. B. ..... —
Connelly Iron Sponge and Governor Co. 26
Connersville Blower Co. 8
Crane, Wm. M. 9
Cruse-Kemper Co. 37

Davis & Farnum Co. 18
Detroit Brass & Malleable Works 27
Dixon Crucible Co., Jos. 35
Donaldson Iron Co. 37

Electrical Testing Laboratories 18
Equipment Exchange 27
Equitable Meter Co. 19
Estate Stove Co. ..... —

Freese, Fred W. ..... .19

Gardner, James, Jr., Co. 33
Gas Engineering Co. 37
Gas Machinery Co. 29
Gas Purifying Material Co. 18
Gautier, J. H., & Co. 23
General Gas Light Co. 31
General Specialty Co. 16
Gerould, C. L. 37
Geyser Sales Co. 25
Gleason, E. P., Mfg. Co. 37
Griffin & Co., John J. .....Fourth Cover

Helme & McIlhenny 40
Hunt, C. W., Co. 7

Improved Equipment Co. 16
Iron Hydroxide Co. 28
Isbell-Porter Co. 37

Johnson Gas Appliance Co. 35

Keller, C. M. 26
Kemp, C. M., Co. 23
Keystone Refractories Co., Inc. ..... —
Koppers Co. ..... —

Lambert Meter Co. 35
Lattimer-Stevens Co. ..... —
Logan County Coal Corpn. 29
Lovekin Water Heater Co. 15
Ludlow Valve Mfg. Co. 20

McDonald, D., Co. ..... —
Maehler, Paul, Co. 19
Maryland Meter Co. 41
Metric Metal Works ..... —
Michigan Ammonia Works 26
Milwaukee Gas Specialty Co. 38
Missouri Firebrick Co. 23

Nye Tool & Machine Works ..... —
Needham Gas Appliance Co., The 35
New York Engineering Co. 19
North River Chemical Corpn. ..... —

Parker-Russell Mining & Mfg. Co. 28
Peerless Stove & Manufacturing Co. 14
Pittsburgh Meter Co. ..... —
Pittsburg Water Heater Co. 19
Precision Instrument Co. 13
Precision Thermometer & Instrument Co. 37
Protecto Safety Appliance Co. ..... —

Quigley Furnace Specialties Co. 35

Randolph, W. W. 18
Reynolds Gas Regulator Co. 23
Ridgway & Son, Craig 20
Russell Engineering Co. 18
Roper, Geo. D., Corpn. 17
Ruud Mfg. Co. ..... —

Safety Gas Main Stopper Co. 30
Sprague Meter Co. 30
Stacey Bros. Gas Construction Co. 12
Stacey Manufacturing Co. 5
Steere Engineering Co. 37
Strickler, W. W., & Bros. 37
Stupakoff Laboratories, The 26
Superior Meter Co. 11
Surface Combustion Co., The 35

Tufts, Nathaniel, Meter Works ..... —

Unger, John S. 18
U. G. I. Contracting Co. 10
United Lead Co. 37
U. S. Cast Iron Pipe & Foundry Co. 27

Wales Co. .....Front Cover
Welsbach Co. 25
Welsbach Street Lighting Co. 38
Western Gas Construction Co. 2
Westmoreland Coal Co. 23
West Gas Improvement Co. of America 3
White, J. G., Engineering Corpn. 18
Westinghouse Elec. & Mfg. Co. 35

BUYERS REFERENCE INDEX, PAGES 34 AND 36

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